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Doctoral Program in Architecture. History and Project

Study on Urban Form Changes and Urban Transformation of Modern Luoyang (1910s-1960s)

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A handwritten signature in black ink, appearing to read 'Junxian WU', with a stylized, flowing script.

Junxian WU

Torino, MAR 23, 2025

Summary

Urban history is a precious memory of urban development. Especially in the context of China's rapid development today, sorting out, reviewing, and interpreting urban history from different perspectives can provide necessary references for current urban preservation work. Luoyang, as the birthplace of Chinese civilization, has a long history as a capital city. Although Luoyang gradually declined into an ordinary Prefecture-level city after the Song Dynasty, it regained development in the modern period. Especially during the period from the 1910s to the 1960s, for nearly half a century, Luoyang underwent two instances of "building a new urban area near the old part of the city" under the background of militarization and industrialization. This not only formed the modern urban spatial layout of Luoyang but also enabled Luoyang to transition from a traditional agricultural city to a military and political center, and then to a socialist industrial city, achieving a leap from a pre-modern city to a modern city. The unique development process created the distinctive characteristics of modern Luoyang's spatial layout. Studying this process helps to reveal the development and transformation of modern Luoyang and provides reference for current urban construction in Luoyang.

Urban form is the projection of urban development history in the material space of the city. The formation of urban morphological regions varies according to different historical contexts. Changes in the elements of urban morphology, as well as their increase and decrease, can directly reflect the process of urban development. Analyzing this process can transcend the technical dimension and further involve changes in social life. This dissertation establishes the "History-urban form -Transformation" analytical framework, with history as the basis and morphology as the intermediary, to discuss the urban transformation and social changes in modern Luoyang. In the two urban construction practices of "building a new urban area near the old part of the city" in Luoyang, the "new urban area" as the key construction object and the relatively unchanged "the old part of the city" jointly shaped the modern urban spatial layout of Luoyang, forming three discontinuous urban morphological regions: the old city, Xigong, and Jianxi. These regions correspond to different historical contexts, and the distinct differences in

urban forms directly reflect the urban development status of Luoyang at different historical stages.

This dissertation first follows the “history to morphology” approach, reviewing the urban development history of the old city in the late Qing Dynasty, Xigong during the Republic of China, and Jianxi in the early years of the People’s Republic of China. It analyzes the formation factors of urban morphology in these areas, clarifies their overall characteristics, and interprets the corresponding morphological elements. The old city retained traditional Chinese urban morphology, Xigong reflected a military urban morphology, and Jianxi exhibited the morphology of a modern industrial city. On the basis of clarifying the morphological characteristics and elements of different regions in modern Luoyang, this dissertation then discusses the transformation through morphology. Through the comparison of the morphological characteristics and elements of the old city, Xigong, and Jianxi, it explains the process of urban transformation in Luoyang. Further combined with historical facts, it explores the stage characteristics of the urban transformation of modern Luoyang, clarifying the profound impact of industrialization in the early years of the People’s Republic of China on the urban transformation and its important role in the construction of modern Luoyang’s cities and social life.

Finally, this dissertation discusses the lasting impact of the urban transformation in the early years of the People’s Republic of China on the development of modern Luoyang, analyzing the promotion and application of the urban construction and organizational models of Jianxi to Xigong and the old city, highlighting the crucial role of the “danwei” as a special spatial organization model in the construction of modern Luoyang’s urban space. Based on this, the dissertation also discusses the continuity between the modern and traditional aspects of the city from the perspectives of spatial structure and morphological comparison, and clarifies the characteristics of modern Luoyang’s urban construction.

Through the study of the morphological changes and urban transformation of Luoyang from the late Qing Dynasty to the early years of the People’s Republic of China, this dissertation constructs the “History - urban form -Transformation” analytical framework, presenting a comprehensive account of the growth and

change process of modern Luoyang's city, revealing the unique features of the two instances of "building a new urban area near the old part of the city" in modern Luoyang, explaining the discontinuous development of modern Luoyang's urban morphology and its complex causes, analyzing the three-stage characteristics of urban transformation in modern Luoyang, and clarifying that socialist industrialization is the essential driving force behind the transformation of modern Luoyang's urban development.

Keywords: Luoyang, Urban Morphology, Urban Transformation, Danwei, Socialist city

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I dedicate this work to my family—my parents, Luoping Zhang and Wei Wu; my aunt, Lok Man Cheung; and my sister, Wendy Lam. Thank you for your unwavering support throughout my journey. You have been my strongest pillars, providing me with encouragement, love, and understanding, be it emotionally, financially, or in everyday life. Your steadfast belief in me has turned aspirations into reality, reminding me of life's beauty and wonders.

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Introduction

1.1 Research background

1.1.1 The need for research on historical and cultural cities

As the center of economic, political, and cultural, cities hold a pivotal position in the overall work of the state. The study of urban history and the preservation of a city's historical heritage have become matters of concern for planners and architects in China recently. Among these, the study and protection of cities with long developmental histories are particularly important, as such cities are the significant achievements of China's civilization and social evolution.

How to protect urban culture and retain people's collective memory of cities has become an urgent issue in China. Especially during the rapid urbanization process in the past decades, large-scale demolition and reconstruction have caused irreversible damage to the original urban landscape and have led to problems such as homogenization across cities and a lack of distinctive urban features. In recent years, as urban development has shifted from expansion to urban renewal, how to revive old cities, properly activate historical buildings, repurpose their functions, and continue the historical fabric of cities has become a critical topic in urban planning, urban design, and urban regeneration.

Luoyang is a significant birthplace of Chinese civilization. Since the Xia (Hsia, 夏) Dynasty, more than ten dynasties have established their capitals in Luoyang, endowing it with a long history and rich heritage. In 1982, Luoyang was designated as one of the first national historical and cultural cities (国家历史文化名城), further highlighting its crucial role in the cultural inheritance. Therefore, elucidating the morphological changes and urban transformation of modern Luoyang during its two phases of "building a new urban area near the old part of the city (避开旧城建新城)" will help to understand the growth process of today's Luoyang and the corresponding social changes, providing a necessary basis for the endeavor of urban conservation.

1.1.2 The unclear characteristics of modern Luoyang urban development

In the current urban conservation efforts in China, there is a focus not only on the protection of ancient cities and historical sites but also on industrial heritage, which emerged during the growth of the People's Republic of China (PRC). These temporal structures, which became clearer as urban development progressed in the modern era, are where the collective memory of cities resides. Luoyang, with its deep historical and cultural roots, became a key city in national development after the founding of the People's Republic, serving as a vanguard of socialist industrialization. However, existing research on Luoyang tends to focus on its ancient history as a capital city, with less attention given to its modern era. Moreover, the existing research has not established a continuous perspective that thoroughly examines the changes in modern and contemporary Luoyang. Yet, the urban layout of contemporary Luoyang is closely related to the spatial structure of modern era, making it crucial to clarify the characteristics of Luoyang's urban modernization.

Given this context, this study focuses on the urban development of Luoyang from the 1910s to the 1960s, a period spanning approximately half a century. The selection of this timeframe is significant: the 1910s marked the transition from the late Qing Dynasty to the Republic of China (ROC), and at the national level, the end of feudal rule signaled the beginning of further modernization efforts. As for Luoyang, the construction of the Xigong military camp (西工兵营) in 1914 was a key turning point in its development under a military backdrop during the Republic period. By the 1960s, against the background of "Socialist industrialization" in the early years of the PRC, Luoyang underwent rapid development, and a modern urban framework had begun to take shape. During this period, Luoyang twice adopted the urban construction model of "building a new urban area near the old part of the city," resulting in distinct urban forms that reflected the different missions of cities during the ROC and the early PRC. These forms not only shaped the spatial characteristics of Luoyang but also responded to the city's unique historical context.

1.1.3 Focus on the history of "non-central" cities

In existing studies on modern and contemporary Chinese cities, much of the focus has been placed on cities of significant importance, such as Beijing, Shanghai, and Guangzhou, which are political, economic, and cultural centers, or coastal and river port cities like Quanzhou, Xiamen, and Chongqing. On the one hand, these

cities were among the earliest to be influenced by foreign economies and cultures, with some even establishing concessions. Under the impact of external factors, they exhibited modernity early and have often been viewed as starting points for the study of modern Chinese cities. On the other hand, the archival records of these cities are relatively complete, providing ample support for related research. The attention on these cities is clearly reflected in the research outcomes of scholars in China and overseas, with numerous papers and monographs offering comprehensive analyses and discussions on these central cities. In terms of research perspectives and depth, these studies are far ahead of those on ordinary cities.

In contrast, Luoyang seems to belong to another category of cities. It possesses a long historical and cultural heritage, yet it has not received the attention it deserves in the field of urban studies, particularly in research on modern urban development. However, such “non-central” cities play an equally significant role in the nation’s historical development. Although in recent years, with the continued advancement of urban research in China, more attention has been paid to studies on “non-central” cities like Luoyang, there remains a need for further research in terms of both quantity and diversity of methodology. Therefore, this study not only responds to the necessity of researching historic and culturally significant cities and clarifying the characteristics of Luoyang’s modern urban development, but also contributes to the study of “non-central” cities, while enriching urban historical research with the application of urban morphology.

1.2 Research objectives and significance

1.2.1 Research objectives

(1) Showcasing the characteristics of modern Luoyang’s urban development and clarifying the formation process of its urban structure

Under the wave of national development in the modern era, Luoyang expanded its urban boundaries and experienced continuous changes in its urban form due to political and economic shifts. The two phases of “building a new urban area near the old part of the city” during the ROC and the early years of the PRC resulted in three spatially discontinuous and morphologically distinct urban areas, each corresponding to a different historical background or development vision. However, these characteristics have not been adequately addressed in existing studies of Luoyang, and the social significance behind the differences in urban form across different periods has not been clearly presented. Moreover, the relationship between

the tangible urban form and intangible social development is mutually reinforcing. Changes in politics, economics, and culture influence the shaping of urban form, while urban form can also serve as a means of shaping new ways of life. Thus, the history of urban development is both a “cause” of urban form and an “effect” influenced by it. This mutual influence is a key focus of this study. In summary, this research aims to combine urban morphology with the historical development of Luoyang, analyzing the changes of urban form, and discussing the planning concepts and social significance behind different urban forms, thereby revealing the characteristics of modern Luoyang’s urban transformation

(2) Discussion on the modern and contemporary urban transformation and social change in Luoyang, providing a more comprehensive presentation of the city’s development process

Since modern times, under the urban construction model of “building a new urban area near the old part of the city” on two occasions, Luoyang has exhibited leapfrog development, with discontinuous urban forms corresponding to different stages of social development. This study establishes a new research framework that combines urban morphology with this characteristic, aiming to use urban form—this tangible material entity—as an intermediary between history and urban transformation. By reviewing the historical roots of the three distinct urban areas formed during the two phases of urban construction from the 1910s to the 1960s, summarizing their morphological characteristics, and identifying relevant morphological elements, this study aims to explain the social changes in Luoyang during different historical stages and provide a comprehensive view of modern Luoyang’s urban development. This research also seeks to clarify the logic behind Luoyang’s urban reconstruction after the founding of PRC and explore its connection to tradition.

This approach is not only applicable to the study of Luoyang but can also be used for research on other rapidly developing cities in China. Clearly defining the morphological areas of different periods and revealing the temporal structures and social significance of cities will not only help clarify the historical development of cities but also provide a reference for contemporary urban conservation, urban design, and architectural design. This will enable a better spatial continuation of a city’s fabric and heritage, preserving the collective memory of cities.

(3) Enriching historical research on “non-central” cities

From the perspective of research subjects, existing studies on modern cities often focus on central cities or port cities. These cities were among the earliest to actively or passively undergo modernization due to external cultural influences in recent history and are often regarded as representatives of modern urban development in China. However, located in the Central Plains, Luoyang, because of its geographical position, experienced less outside influence in the Late Qing period. Nevertheless, its development process remains distinctive—twice adopting the “building a new urban area near the old part of the city” model during the Republic of China and the early years of the People’s Republic. While conforming to development trends, this also created a unique urban structure. Additionally, as a “non-central” city, some characteristics of Luoyang’s modern development may be more representative, and related analyses could help us better understand the modernization process of Chinese cities.

From the perspective of time periods, most studies on Luoyang’s urban development focus on its ancient history, with insufficient attention paid to the modern period, particularly the 1910s to 1960s. This period of dramatic change not only laid the foundation for modern Luoyang’s spatial structure but also served as an important witness to Luoyang’s transition from a traditional agricultural city to a modern industrial city. However, existing research does not provide specialized studies on this period. Therefore, in terms of both research subjects and the selection of time periods, this study can be seen as a supplement to current research on modern Chinese cities.

1.2.2 Research significance

(1) Theoretical significance

The theories of urban history and urban morphology have undergone long-term development in Western countries and have become increasingly mature. Relevant studies have provided significant support for urban planning, urban design, and the conservation of urban historical heritage. However, urban development in the West and China is based on different ideologies and has followed distinct trajectories. For example, the continuous transformation of urban morphology in Western cities differs from the discontinuities in urban forms underlying China’s rapidly changing urban landscape. Furthermore, existing research on urban morphology often focuses only on specific historical urban districts, aiming to guide particular strategies for urban conservation or architectural design.

In contrast, this study expands the theoretical and methodological framework of urban morphology by addressing the discontinuous urban forms of modern and contemporary Luoyang. Combining urban morphology with urban historical research, it focuses on the entire city and examines the urban morphological differences created by Luoyang's two phases of building a new urban area near the old part of the city in modern times. The study analyzes the processes of urban development and transformation reflected in these discontinuities and their characteristics. Through comparisons of the different urban forms, it discusses the continuity between modern and traditional elements in Luoyang's urban construction after the founding of the PRC.

Against the backdrop of dramatic changes and rapid development in modern Chinese cities, the coexistence of multiple urban morphologies, as exemplified by Luoyang, reflect certain characteristics of urban development in other Chinese cities. The study offers a new viewpoint for urban historical research, enriches the theoretical framework of urban morphology, and provides inspiration for the study of urban forms and histories in China.

(2) Practical significance

This study could provide references for urban planning, urban design, and architectural design practices specific to Luoyang. Contemporary China faces challenges in the protection of urban historical and cultural heritage, as well as the redevelopment of industrial heritage. Research on urban form and urban transformation has the potential to guide corresponding practices. As in Western studies of urban morphology, which can lead to an "operative history," this research reveals the processes of urban form formation and provides analysis and summarization of morphological types. It clarifies the causes and characteristics of urban spatial structures, serving as a vital historical foundation for urban planning and renewal efforts.

Currently, urban design and planning in China increasingly respect urban contexts and strive to identify and preserve the historical traces of cities. The urban form of Luoyang is the result of its urban construction and social development. This study's exploration of the causes of Luoyang's urban form and its analysis of morphological elements, such as building types and street patterns, contribute to understanding the temporal structure of modern Luoyang's urban space. This will provide significant support for ongoing efforts in Luoyang's historical and cultural conservation, industrial heritage protection, and urban renewal. The analysis of

urban transformation highlights the features of modern Luoyang's urban development and elucidates the profound meanings behind the spatial structure of modern Luoyang.

1.3 Literature review

This study focuses on the Luoyang's urban form changes, using it as an intermediary to discuss Luoyang's historical development and urban transformation. From this perspective, the study encompasses three main aspects: urban history, urban morphology, and research on Luoyang's urban history. Accordingly, the literature review section will address these three primary aspects and provide a critique of existing research.

1.3.1 Research on urban history

1.3.1.1 Research outside China

Urban history is an interdisciplinary field influenced by various humanities disciplines, including art, culture, photography, and archaeology. In terms of its developmental trajectory, urban history stems from the lineage of economic history but focuses more comprehensively on the entire history of the city as a physical entity. This includes how cities are planned, designed, built, inhabited, owned, celebrated, destroyed, and abandoned (Ewen, 2016, p.11-12). Throughout this process, the city itself is both the subject through which these variables occur and the object of study.

In terms of specific research, the study of urban history, particularly in Western countries, began early, emerging around the late 19th and early 20th centuries. Prior to this, there was no strictly defined field of urban history; descriptions of cities were primarily found in local histories and biographies. By the late 19th century, research on urban conditions largely stemmed from concerns about urban problems, such as overcrowding, poverty, and poor sanitation. This led to efforts to construct a more systematic and well-planned society, and urban history emerged within this context.

One of the earliest systematic works in this field is *The City* by German sociologist Max Weber, published posthumously. The book examines the development of Western cities, highlighting their unique characteristics, such as fortifications, markets, legal structures, and forms of political autonomy. Weber portrayed the city as a distinctive form of social organization, different from rural

areas, and analyzed the formation and evolution of cities within different historical contexts. He also revealed the social functions of cities, emphasizing their roles as centers of economic, political, and cultural activity, while also comparing the differences between Eastern and Western cities (Weber, 1921). Another key work is American historian Arthur M. Schlesinger's *The Rise of the City, 1878–1898*, which marks the birth of American urban history research and highlights the United States' transition to an industrialized urban nation (Schlesinger, 1933).

Significant progress in urban history research occurred around the 1960s, when academic activities and exhibitions sparked further interest in urban issues, leading to breakthroughs in the field. During this time, different countries established their own urban history research organizations. For example, in the 1950s, the American Historical Association formed an urban history group. In 1964, the Colegio de México established the Center for Urban and Population Studies to examine the population and urbanization of Mexico and Latin America. Chile formed the Interdisciplinary Committee on Urban Development in 1964 with support from the Ford Foundation, and Finland established the Center for Urban and Regional Studies in 1968 (Wang, 2018).

It was also during this period that many influential works in urban history were published. One such milestone is *The City in History: Its Origins, Its Transformations, and Its Prospects* by Lewis Mumford. Mumford's book, which integrates perspectives from history, sociology, architecture, and ecology, provides a detailed analysis of cities across different regions and historical periods. It covers the entire process of urban development, from the origins of ancient cities to the formation of modern cities, emphasizing the role of cities as centers of civilization and advocating for sustainable social and environmental development (Mumford, 1961).

British urban scholar Harold James Dyos, often referred to as the father of urban history, organized the "Urban History Group" between 1963 and 1978. This group pioneered the study of urban biographies, focusing on individual cities to illustrate how cities form and function. Unlike earlier works that emphasized grand narratives, urban biographies focus on the development of individual cities. Dyos, along with historian Michael Wolff, co-edited *The Victorian City: Images and Realities*, a collection of essays covering various fields such as sociology, economics, architecture, literature, and cultural studies. This work primarily examines the development of British cities during the Victorian era and highlights the profound impact of industrialization on urban structures and residents' lives. The collection

also emphasizes the interdisciplinary nature of urban history, showing how it intersects with other disciplines to study urban history from multiple perspectives (Dyos & Wolff, 1999).

In the 1980s, influenced by developments in cultural history, urban history underwent corresponding changes, shifting from a singular narrative to multiple narratives and adopting new research perspectives (Chen, 2109). Urban historians began focusing on how urban culture is transmitted throughout history in the postmodern context. The intersection of urban history with architectural history, social history, and cultural history opened new avenues for research, greatly enriching the field of urban history. British planner and urban studies scholar Peter Hall, in *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century*, focused on urban planning to discuss 20th-century urban development. Hall's work combines perspectives from various disciplines, presenting different schools of urban design thought and analyzing case studies to illustrate the relationship between urban planning ideas and urban planning itself (Hall, 1988). By the end of the 20th century, the shift in urban history became more pronounced, with its interdisciplinary nature growing stronger. American historians Edwin G. Burrows and Mike Wallace co-authored *Gotham: A History of New York City to 1898*, using a multidisciplinary approach to examine New York's social transformation from its origins as a Dutch colony in the 17th century to its consolidation as a metropolis in 1898. The book explores topics such as population, architecture, planning, politics, and other aspects to reveal the complexity and diversity behind New York's urban development (Burrows & Wallace, 1998). British author Peter Ackroyd's *London: The Biography* uses a biographical approach to explore London's social, economic, and cultural changes from the Roman era to modern times (Ackroyd, 2000). British historian Alistair Horne's *Seven Ages of Paris* selects seven key historical periods from the 12th to the 20th century, combining perspectives from political, cultural, and social history to showcase Paris's role as a political and cultural center and its influence on social change, as well as how urban planning has shaped the city's social structure and way of life (Horne, 2002). Irish historian David Dickson's *Dublin: The Making of a Capital City* explores the transformation of Dublin from a medieval settlement to a modern city, using political, economic, social, and cultural perspectives to reveal the city's historical evolution (Dickson, 2014).

In addition to discussions spanning long time periods, some urban histories focus on specific historical eras. For instance, *Paris Reborn: Napoléon III, Baron Haussmann, and the Quest to Build a Modern City* by architectural and urban

historian Stephane Kirkland details the profound impact of Napoleon III and Baron Haussmann on Paris's modernization. It discusses Haussmann's role in reshaping Paris's streets, squares, buildings, parks, and infrastructure, and examines the effects of this transformation on social structure and daily life (Kirkland, 2013).

Other works examine urban development through major historical events or natural disasters. For example, *Tokyo: A Biography* by writer and historian Stephen Mansfield provides a detailed account of Tokyo's history from ancient to modern times, discussing how different historical periods, including cultural ideologies like Neo-Confucianism and significant events such as the arrival of Commodore Perry's "Black Ships," impacted the city. Mansfield also analyzes Tokyo's reconstruction following natural disasters (such as earthquakes) and the devastation of World War II, exploring its development from the perspectives of disaster management, reconstruction, and social change (Mansfield, 2016).

In general, urban history in the 20th century continued to evolve, becoming increasingly organized and undergoing multiple shifts in concepts, methods, and geographic scope. Since entering the 21st century, urban history research has become more diverse and multifaceted, with an increasing variety of research methods and perspectives. Notably, at the turn of the century, the earlier "Eurocentric" focus of Western urban history began to shift, with growing attention paid to the development of cities in Asia, Africa, and Latin America, further advancing the study of urban history worldwide (Ewen, 2016).

The earliest research on Chinese cities began in the 1970s. William Skinner's *The City in Late Imperial China* includes contributions from various scholars on cities in the Ming and Qing dynasties. These essays analyze the characteristics of ancient Chinese cities from historical, spatial, and social perspectives, covering topics such as urban planning, urban form, architecture, and urban governance, providing a comprehensive overview of ancient Chinese cities (Skinner, 1977). Victor F.S. Sit's edited volume *Chinese Cities: The Growth of the Metropolis Since 1949* discusses urban planning and urban issues in five major cities—Beijing, Shanghai, Nanjing, Xi'an, and Guangzhou—after 1949 (Sit, 1985). British historian Stephen Turnbull's *Chinese Walled Cities 221 BC–AD 1644* focuses on city walls and selects a range of historical cities, including both capitals and regional cities, analyzing their historical development, with attention not only to urban form but also to changes in urban social life and the impact of warfare on cities (Turnbull, 2009). *New Narratives of Urban Space in Republican Chinese Cities*, edited by Chinese historian Billy K. L. So and American Sinologist Madeleine Zelin, focuses

on the cultural dimensions of urban space. Using a historical-cultural narrative approach, it constructs an analysis of Republican-era Chinese cities through case studies, exploring the relationship between social order, legal order, governance, and urban change, while discussing topics such as urban history, planning, management, judicial systems, refugee relief, and public health (So & Zelin, 2013).

These studies by overseas scholars on Chinese urban history primarily focus on the early modern and modern period and take diverse perspectives, greatly enriching the field of Chinese urban history. Their work complements the efforts of Chinese scholars and has significantly advanced research in the field of Chinese urban history.

1.3.1.2 Research in China

Urban history in modern China did not develop as early as it did in the West. It was only in the 1920s and 1930s, with the advancement of the nation's modernization process, that relevant urban surveys began to emerge. In 1926, Liang Qichao published articles such as *Zhongguo Dushi Xiaoshi* (A Brief History of Chinese Cities) and *Zhongguo zhi Dushi* (Chinese Cities), marking the beginning of urban history research in China (Wu, 2019). However, the outbreak of the the Chinese People's War of Resistance against Japanese Aggression forced these survey efforts to halt. It was not until after the founding of the PRC that scholars resumed the earlier urban studies. After the founding of People's Republic, especially since the reform and opening-up in 1980s, the process of urbanization accelerated, and the role and importance of cities in economic and social development grew. This prompted the academic community to focus on the historical evolution of cities, their functional structures, and urban-rural relations, making urban history a key area of historical research (He, 2024). Urban history has since gained increasing attention from scholars, and by the late 1980s, it was formally recognized as a subfield of history (Gu, 2023, p.3).

Since the 1980s, Chinese urban history research has mainly been divided into two categories. One category focuses on ancient Chinese cities, with some studies covering broad historical periods and others concentrating on specific dynasties, employing grand narratives to summarize the development patterns and characteristics of ancient cities. For instance, Guo Husheng, an architectural and urban historian from Southeast University, was among the first to study ancient Chinese cities in the 1980s from an architectural perspective. His research focused on three aspects: local city institutions, palace cities and imperial cities, and ancient

urban engineering technology. He published articles such as *The Zicheng Zhidu* (Suburban System) in 1985, *Zhongguo Gudai Chengshi Shuigong Sheshi Gaishu* (An Overview of Ancient Chinese Urban Hydraulic Engineering Facilities) in 1991, and *Taicheng Kao* (Research on Taicheng). Around the same period, Tongji University's Dong Hongjian published *Zhongguo Chengshi Jiansheshi* (A History of Urban Construction in China) in 1982, Fudan University historian Yang Kuan studied the layout and institutional structures of ancient Chinese capital cities, and Beijing Normal University's economic historian Fu Zhufu examined the development of ancient cities from an economic history perspective. He Yejue later published *Zhongguo Gudai Chengshi Guihuashi* (A History of Ancient Chinese Urban Planning) in 1996. Scholars have since conducted more specialized research on different historical periods. For example, Liu Fengyun published *Ming Qing Chengshi Kongjian de Wenhua Tanxi* (Cultural Analysis of Ming and Qing Urban Spaces) in 2001, Chen Guocan published *Songdai Chengshi Yanjiu* (Research on Song Dynasty Cities) in 2002, Lu Shan published *Songdai Dongnan Gangshi Yanjiu* (Research on Southeast Ports in the Song Dynasty) in 2002, Zhuge Jing published *Liao Jin Yuan Shiqi Beijing Chengshi Yanjiu* (Research on Beijing Cities in the Liao, Jin, and Yuan Periods) in 2003, Xiao Hongyan published *Dongzhou Yiqian Chengshishi Yanjiu* (Research on Pre-Eastern Zhou Urban History) in 2003, and Zhang Jihai published *Handai Chengshi Shehui* (Han Dynasty Urban Society) in 2006.

In the past decade, scholars have compiled and published extensive research on urban history, summarizing the characteristics of cities across different historical periods. For instance, Sichuan University's He Yimin published *Zhongguo Chengshishi* (A History of Chinese Cities), which discussed the development and characteristics of Chinese cities from the pre-Qin period to the Republic of China (He, 2012). Cheng Yinong from Yunnan University published *Zhongguo Chengshishi Yanjiu* (Research on Chinese Urban History), which introduced important works in the field of Chinese urban history and highlighted key issues in urban research (Cheng, 2020).

The second category of research focuses on individual cities, with early studies often concentrating on major cities like Shanghai, Beijing, Chongqing, Hong Kong, and Macau—cities that initiated the modernization process early on and served as political, economic, and cultural centers. Notable works include Zhang Zhongli published *Jindai Shanghai Chengshi Yanjiu, 1840-1949* (Urban Research on Modern Shanghai, 1840-1949) in 1990, Wei Yingtao Published *Jindai Chongqingshi Yanjiu* (A History of Modern Chongqing) in 1991, Luo Shuwei

Published *Jindai Tianjin Chengshishi* (A History of Modern Tianjin) in 1993, Pi Mingxiu Published *Jindai Wuhan Chengshishi* (A History of Modern Wuhan) in 1993, and *Kaifeng Chengshishi* (A History of Kaifeng), edited by Cheng Ziliang and Li Qingyin in 1993, and Yu Shengwu Published *Shijiu Shiji de Xiangang* (Nineteenth-Century Hong Kong) in 1994. In later years, as the discipline of urban history matured and the number of researchers grew, more cities have been systematically studied.

At the turn of the 21st century, urban history research in China began to undergo changes influenced by foreign trends. With increasing scholarly exchange between domestic and international researchers, many excellent foreign works were introduced to China, offering new perspectives on urban studies. Simultaneously, the gradual opening of relevant archives has clarified modern Chinese urban studies, greatly promoting research in this field by both domestic and overseas scholars. The diversity of perspectives in urban history research—ranging from macro to micro—has become increasingly evident.

For example, Fu Xinian's *Zhongguo Gudai Chengshi Guihua, Jianzhuqun Buju ji Jianzhu Sheji Fangfa Yanjiu* (Research on Ancient Chinese Urban Planning, Urban Layout, and Architectural Design Methods) discusses the characteristics of ancient Chinese urban development from both planning and architectural perspectives (Fu, 2001). Taiwanese scholar Li Xiaoti's *Zhongguo de Chengshi Shenghuo* (Chinese Urban Life) collects thirteen essays by Chinese and overseas scholars on urban studies in China, spanning from the Qing Dynasty to the Republic of China. These essays discuss topics such as religion, commerce, specific professions (e.g., street vendors, water carriers), streets, and the relationship between culture and the city, blending cultural history, social history, and urban history to clarify modern elements in urban development and reveal China's modernization process (Li, 2006). Wu Qingzhou of South China University of Technology's *Zhongguo Gucheng Fanghong Yanjiu* (Research on Flood Control in Ancient Chinese Cities) analyzes the spatial characteristics of ancient Chinese cities from a hydraulic engineering perspective (Wu, 2009). Wang Di of the University of Macau, in *Jietou Wenhua: Chengdu Gonggong Kongjian, Xiaceng Minzhong yu Difang Zhengzhi, 1870-1930* (Street Culture: Public Space, Subalterns, and Local Politics in Chengdu, 1870-1930), focuses on the micro-level of streets and public spaces, analyzing people's behaviors in these places and revealing the changing relationships between officials, elites, and the public as society developed (Wang, 2006). Wang Di's *Chaguan: Chengdu de Gonggong Shenghuo he Weiguan Shijie, 1900-1950* (The Teahouse: Public Life and Microcosm in Chengdu, 1900-1950)

uses the teahouse, an ordinary establishment in Chengdu, to analyze the changes in this institution across different historical periods and discuss urban life and social transformation (Wang, 2010). Compared to other scholars who focus more on major cities like Beijing and Shanghai, Wang Di's research on Chengdu enriches our understanding of inland cities in China and offers a new research perspective. Additionally, the urban morphology, which is a focus of this article, has gradually showcase a potential as an entry point for urban historical research. Related works will be elaborated upon in the next section on "Urban Morphology Studies in China."

In summary, although the development of urban history began at different times in China and abroad, and the process has shown significant differences, both fields have exhibited similar trends in recent years. On the one hand, cultural exchanges between China and the West have introduced many foreign ideas and methods. On the other hand, the interdisciplinary nature of urban history, with its intersections with cultural history, social history, and architectural history, has greatly expanded the research framework. In this context, Chinese urban historians have continuously adapted Western theories and methods to China's specific conditions and are committed to exploring and establishing indigenous theories and methods in Chinese urban history.

1.3.2 Research on urban form

Urban morphology is a direct reflection of urban development at the material level. Whether in the form of long-term stable patterns or rapid transformations driven by social change, aspects such as urban expansion, decline, and relocation of city sites provide a clear lens through which to understand urban development and change. They also serve as starting points for analyzing cities, societies, and the perceptions of daily life. The study of urban morphology is comprehensive and interdisciplinary. Its diachronic and historical focus on urban morphological transformations inherently establishes a deep connection with the urban history. In specific research contexts, urban morphology intersects with disciplines such as history, urban planning, architecture, sociology, geography, and economics. This interdisciplinary approach provides a more comprehensive and diverse perspective for understanding urban historical development, interpreting urban spatial structures, and analyzing urban transformations.

1.3.2.1 Research outside China

The study of urban morphology originated in the German-speaking world. In 1894, Johannes Fritz, a teacher at a Strasbourg-based high school (Hofmeister, 2004), was one of the earliest scholars to use town plans extensively to analyze the layout of German cities. His work *Deutsche Stadtanlagen* (The Layout of German Towns) classified towns based on their layouts (Fritz, 1894). Although early 20th-century German geographer Otto Schluter cited some of Fritz's maps in his own urban morphology research, Fritz's work has often been overlooked by later scholars of morphology because he did not publish his research in scientific journals. Nevertheless, Fritz should still be regarded as one of the founders of urban morphology due to his early work in the classification of German town forms (Simms, 2016).

Before World War II, Germany dominated the field of urban morphology, with scholars like Otto Schluter building upon the work of Fritz and others. Schluter's publication *Über den Grundriss der Städte* (On the Layout of Towns) marked the further systematization of urban morphology and its potential as a subfield of geography. Schluter went on to propose the new discipline of human geography, creating the concept of "cultural geography" and introducing the idea of *Morphologie der Kulturlandschaft* (the morphology of the cultural landscape). He focused on material forms and urban landscapes, viewing them as a unique type of cultural landscape (Duan & Qiu, 2008).

In contemporary urban morphology research, the field has been largely influenced by two schools of thought that developed simultaneously after World War II: the Muratori School (also known as the Italian School) from the field of architecture and the Conzen School (also known as the British School) from the field of geography.

The Muratori School was founded by Saverio Muratori, who emphasized the importance of "building types" in urban form and saw urban morphology as an ongoing process. Their theory and methods sought to create a typology-led planning technique. In 1959, Muratori published *Studi Per Una Operante Storia Urbana di Venezia*, based on his research in Venice, in which he used extensive morphological maps to illustrate the continuous historical development of Venice's urban form (Muratori, 1959).

Muratori's pupil, Gianfranco Caniggia, further developed his mentor's theoretical ideas. Caniggia's study of Como, based on historical documents, surveys,

and imagination. His work clarified the relationship between urban form and history, leaving a lasting influence on Italian typo-morphological research (Caniggia, 1984). Caniggia's philosophical ideas are deeply reflected in the books he co-authored with Gian Luigi Maffei (1942–2019): *Interpreting Basic Buildings* and *Interpreting Specialised Buildings*.

In 1960, M.R.G. Conzen introduced key concepts in urban morphology in his book *Alnwick, Northumberland: A Study in Town-Plan Analysis*. Using the Alnwick as an example, Conzen analyzed plots, street networks, land-use patterns, and buildings in detail to demonstrate the spatial structure changes in urban development (Conzen, 1960). Subsequently, scholars who followed this approach further expanded the theories and methods of Conzen's urban morphology studies, ultimately forming the Conzenian school, which emphasizes the historical urban landscape.

The Conzen School viewed historical landscapes as holistic entities and, using detailed cadastral information, developed a method of dividing cities into morphological regions based on historical characteristics, referred to as “urban landscape units”. This approach was later expanded to include a micro-morphology method at the block level, moving from the physical to the human aspects of urban form.

In the study of urban landscape units, the Conzen School broke the town plan into three components: plan units, building types, and land and building utilization. The plan unit, in turn, can be divided into the street system, plot pattern, and building arrangement. These factors provide a structured approach to understanding urban morphology. Regarding morphological change, the Conzen School focused on the analysis of the quantity and type of changes, the impact of decision-makers on the built environment, and the planning and management of historic preservation areas. Overall, the Conzen School's research on urban morphology, based on historical geography, paid particular attention to the impact of policy on morphological development, reflecting a step-by-step analytical method from elements to the whole.

Historically, despite the different national origins and research approaches of the Conzen and Muratori schools, and although their works were written in different languages—Conzen's school stemmed from historical geography with the primary task of reconstructing the historical and geographical development of cities, while the Muratori school approached urban development from an architectural

perspective, seeking principles for urban transformation—there are also points of convergence between the two. Both schools focus on spatial division in research and emphasize material space. By the 1980s, with increasing exchanges between the two schools, they laid the foundation for the International Seminar on Urban Form (ISUF), established in 1994. Together with other morphological research from around the world, these two schools expanded the theoretical framework of urban morphology.

Today, in ISUF's journal *Urban Morphology*, there is a noticeable trend toward the growing integration of theories from both the Conzen and Muratori schools. Scholars from various countries continue to adapt these theories to address specific research questions, consistently introducing new approaches and methods for studying urban form. The theoretical system of urban morphology is evolving into a more comprehensive interdisciplinary framework, and there are growing achievements in areas such as urban form description, the generation and evolution of urban form, and the management, protection, and planning of urban morphology (Zhang, 2010).

From the perspective of current research outcomes in urban morphology, beyond the pioneering work of the Conzen and Muratori schools, many other scholars are contributing to the construction and practical application of urban morphology theories. For example, British geographer and urban morphologist J.W.R. Whitehand discussed the relationship between development cycles and urban form in his book *The Changing Face of Cities: A Study of Development Cycles and Urban Form*. He proposed the theory of development cycles and examined how factors such as urban form, building layout, street networks, and land-use patterns change over time, providing an important reference for understanding urban form transformations (Whitehand, 1987). American architectural historian and educator Spiro Kostof authored *The City Shaped: Urban Patterns and Meanings Through History*, which is both a work of urban history and a study of urban morphology. Kostof summarized different types of urban forms through historical case studies, creating a variety of analytical diagrams and categorizing cities based on “organic structures,” “grid cities,” “cities as diagrams,” “grand forms,” and “urban skylines,” demonstrating the complexity and diversity of urban morphology across different historical periods and cultural contexts. He argued that urban form is not just a combination of buildings and streets but also a product of social, political, economic, and cultural forces. (Kostof, 1991) Kostof's other work, *The City Assembled: The Elements of Urban Form Through History*, further identified the basic elements of urban morphology and discussed the

historical evolution of major cities from an interdisciplinary perspective (Kostof, 1992). British geographer and urban morphologist Peter J. Larkham's book *Conservation and the City* discussed the background of urban conservation in Britain and the institutionalization of urban conservation. Using case studies, Larkham analyzed changes in land use and street layouts within different types of conservation areas, discussing the impact of urban conservation from ethical, theoretical, and practical perspectives, and demonstrating the application of urban morphology in urban conservation (Larkham, 1996). American urban scholars Michael Southworth and Eran Ben-Joseph's book *Streets and the Shaping of Towns and Cities* focused on streets and urban form, exploring the relationship between streets, cities, public health, social management, and daily life from a historical perspective, showing how streets shape urban spaces (Joseph, 1997). Lu Duanfang's *Remaking Chinese Urban Form: Modernity, Scarcity and Space, 1949–2005* (2006) summarized post-1949 urban space and planning in China, analyzing the morphological characteristics of socialist cities and discussing the changes brought about by China's reform and opening-up (Lu D, 2006).

In recent years, scholarly works on urban morphology have become increasingly diverse. Some provide general overviews of urban morphology, such as Portuguese urban morphologist Vítor Oliveira's *Urban Morphology: An Introduction to the Study of the Physical Form of Cities*, which serves as an introductory text on urban morphology, outlining its basic components and analyzing the factors influencing the transformation of urban form through historical case studies. The book highlights the integration of theory and practice and discusses the prospects of interdisciplinary collaboration between urban morphology and other fields (Oliveira, 2016).

It is worth noting that the research methods in urban morphology have seen breakthroughs over the past decade, particularly with the spread of digital technologies. Methods such as space syntax, Geographic Information Systems (GIS), and cellular automata are now being used to facilitate more precise data collection and scientific analysis. These methods provide valuable support for interpreting urban morphology (Trisciuglio, Barosio & Ricchiardi, 2021).

1.3.2.2 Research in China

Urban morphology research in China can be traced back to the 1980s and 1990s. In 1982, Professor Qi Kang initiated the discussion on urban morphology in the *Nanjing Gongxueyuan Xuebao* (Journal of Nanjing Institute of Technology)

(Qi,1982). That same year, Professor Qi published the article *Chengshi de Xingtai: Yanjiu Tigang Chugao* (The Morphology of Cities: Draft Outline of Research) in the journal *Chengshi Guihua* (City Planning Review), clearly defining the significance of urban morphology research in China (Qi, 1982). In Qi's view, the city is an organic whole, a dynamic and continuously developing process shaped by the combined forces of nature and human efforts, while also being influenced by political, economic, and social factors. (Liu & Song, 2018) His work marked the beginning of urban morphology research in China.

Professor Qi's students, such as Wu Jin and Deng Hao, further pursued specific studies on Chinese urban morphology. Wu Jin, for example, conducted his PhD research on Chinese urban morphology from a geographical perspective. Subsequently, as international exchanges between China and other countries became more frequent, collaborative research on Chinese urban morphology also began to take place. One notable collaboration involved J.W.R. Whitehand, a leading figure of the Conzen School, who actively engaged with Chinese scholars in related fields. Early examples include studies by Whitehand, Gu Kai, and Tian Yinsheng, who applied Conzen's morphological methods to Chinese cities. For instance, the article *Extending the Compass of Plan Analysis: A Chinese Exploration*, co-authored by Whitehand and Gu Kai and published in *Urban Morphology*, utilized Conzen's methods to study the ancient city of Pingyao in Shanxi Province (Whitehand & Gu, 2007). The book *Guowai Chengshi Xingtai Xue Gailun* (Introduction to Urban Morphology in Foreign Countries), edited by Duan Jin and Qiu Guochao, systematically introduced the major schools of urban morphology abroad and their research status in dozens of countries, presenting a multidisciplinary perspective on urban morphology research (Duan & Qiu, 2009). *Jianzhu Leixingxue yu Chengshi Xingtai Xue* (Architectural Typology and Urban Morphology) by Shen Kening explained the concept of "type" and analyzed the typo-morphological ideas of the Muratori School, interpreting their practices and proposing connections between traditional Chinese types and urban morphology (Shen, 2010). Tian Yinsheng, Gu Kai, and Tao Wei co-authored *Chengshi Xingtai Xue Jianzhu Leixingxue yu Zhuanxing zhong de Chengshi* (Urban Morphology, Architectural Typology, and Cities in Transition), which introduced the basic concepts and development of the Conzen and Muratori schools of urban morphology, while demonstrating the applicability of morphological research to Chinese cities through case studies (Tian, Gu & Tao, 2014). These efforts and publications significantly advanced the field of urban morphology in China.

Owing to the advantage of being written in English and to its early localized research practice, the ideas of the Conzen School have had a major influence on the study of urban morphology in China. However, the influence of the Italian Muratori School also gradually emerged. Chen Fei and Deng Hao published articles in *Urban Morphology* such as *Typomorphology and the Crisis of Chinese Cities* (Chen, 2008) and *Muratori or Rossi? A Chinese Perspective* (Deng, 2016), which explored the prospects for applying typo-morphology, as developed by the Muratori School, in China. Furthermore, the ideas of the Muratori School were introduced to China through design research and joint teaching projects. For instance, Bao Li's book *Leixing de Hengzai yu Chengshi de Tuibian: Nanjing Chengnan Hehuatang Dikuai ji Zhuqu Jianzhu Gengxin Sheji* (Permanence of Type and the Transformation of the City: Design and Renovation of the Nanjing Hehuatang District and Residential Areas) documented the application of morphology and architectural typology in the design and renovation strategies for historical preservation zones in Nanjing. Similarly, the renovation of the Xiaoxihu district in Nanjing was also carried out under the guidance of typo-morphological principles (Bao, 2018).

These studies have made significant contributions to the analysis and interpretation of Chinese cities, particularly in the area of preserving historical cities and districts, where Western urban morphology research has shown considerable adaptability. Tian Yinsheng noted that, while the historical development of Chinese cities differs from that of Western cities, Chinese cities also exhibit distinct stages, which are directly reflected in their material forms (Liu & Song, 2018). This serves as a foundation for the practice of Western urban morphology in China. At the same time, based on the differences between Chinese and Western urban development, scholars have been working to localize urban morphology theories. As early as 2007, Gu Kai pointed out some challenges in studying Chinese urban morphology in his research on Pingyao, such as the differences in historical maps between China and the West and the difficulty in obtaining cadastral maps and other historical materials for Chinese cities (Whitehand & Gu, 2007). This, to some extent, highlighted the necessity of localizing urban morphology research in China. In his 2010 article *Yige Xinde Yanjiu Kuangjia: Chengshi Xingtai Leixingxue zai Zhongguo de Yingyong* (A New Research Framework: The Application of Urban Typomorphology in China), Chen Fei identified unique urban forms that emerged in Chinese cities during different historical stages. Based on this, he proposed seven key elements of Chinese urban morphology: master plans, skylines, streets, blocks, public spaces, public buildings, and residential areas. These elements are crucial for preserving the morphological characteristics of urban areas and maintaining urban diversity, with the goal of guiding design and preserving the cultural features of cities (Chen,

2010). Marco Trisciuglio, drawing on the tradition of Italian typo-morphology, conducted a morphological analysis of the Hehuatang(荷花塘) area in Nanjing, proposing the Topology + Typology + Tectonics method—to interpret the material structure of historical spaces in Chinese cities. This approach encompasses building structures, building types, and urban morphology at multiple scales (Trisciuglio, 2020), enriching the study of urban history while providing important references for the preservation of urban heritage.

Overall, recent developments in the study of Chinese urban morphology exhibit two notable characteristics. On the one hand, similar to urban morphology research worldwide, Chinese urban morphology research has begun to adopt multiple methods rather than relying on a single school of thought. On the other hand, Chinese urban morphology research is increasingly moving towards localization, making adaptive adjustments to Western theories and methods. Whether following the classical urban morphological paths of the Conzen or Muratori schools or incorporating new perspectives and methods from related disciplines, urban morphology research in China has made significant progress over the past decade, gradually establishing a research framework suited to the study of Chinese cities.

Under this gradually improving research framework, an increasing number of papers and monographs on urban morphology have emerged, covering topics such as cities, historical districts, building types, and improvements to morphological methods. For example, *Jinxiandai Wuchang Chengshi Fazhan yu Kongjian Xingtai Yanjiu* (Research on the Development and Spatial Morphology of Modern Wuchang) published by Wu Wei in 2013, *1949 Nian yilai Guangzhou Jiucheng de Xingtai Yanbian Tezheng yu Jizhi Yanjiu* (The Morphological Evolution Characteristics and Mechanisms of Guangzhou's Old City since 1949) published by Huang Huiming in 2014, *Xingtai Leixing Shijiao Xia 20 Shiji Chu Yilai Guangzhou Zhuqu Tezheng yu Yanjin* (The Characteristics and Evolution of Residential Areas in Guangzhou since the Early 20th Century from a Typomorphological Perspective) published by Chen Jintang in 2015, *Guangdong Shunde Chengzhen Kongjian Xingtai Yanbian yu Jizhi Yanjiu* (The Spatial Morphological Evolution and Mechanisms of Towns in Shunde Guangdong) published by Liang Liyun in 2015, *Lanzhou Jinxiandai Chengshi Xingtai Yanjiu* (Research on the Modern Urban Morphology of Lanzhou) published by Yan Wei in 2016, *Hefei Chengshi Fazhan jiqi Xingtai Bianqian Yanjiu* (The Development and Morphological Changes of Hefei) published by Gu Dazhi in 2018, and *Nanjing Xiaoxihu Lishi Diduan Baohu Yu Zaisheng Zhong De Xingtai Leixingxue Fangfa* (The Application of Typomorphology in the Preservation and Regeneration of the

Xiaoxihu Historic District in Nanjing) published by Dong Yinan in 2019. These studies, which approach urban morphology from different perspectives, have greatly enriched the field of urban morphology research in China. Overall, the study of Chinese urban morphology has progressed through various stages, from initial concepts proposed by the older generation of architects, to learning and adopting Western theories, and finally to making adaptive adjustments based on local conditions. Today, this field is no longer confined to any particular theoretical method but is being conducted through comprehensive, multi-scalar, cross-cultural, and interdisciplinary research, tailored to specific situations.

1.3.3 Research on Luoyang's urban history

1.3.3.1 Research on ancient Luoyang

The study of ancient Luoyang's urban history can be divided into two periods. The first is the period when Luoyang served as the capital, during which urban construction activities were flourishing. Records of this period can be traced back to legendary times, such as the "Longma Bearing the River Map (龙马负图)" during the Three Sovereigns and Five Emperors (三皇五帝) era, and the legend of Emperor Ku (嚳), the grandson of the Yellow (黄) Emperor, establishing his capital in Bo (believed to be present-day Yanshi in Luoyang) (Li, 2005). From verifiable historical records, the earliest known urban construction in Luoyang dates back to the Xia Dynasty. The Erlitou site of the Xia capital is often regarded as historical evidence of the earliest China. Following this, the construction of the cities of Luoyi (洛邑) during the Zhou Dynasty laid the foundation for the future urban planning of Luoyang. The two most significant cities in Luoyang's urban history were the Northern Wei capital and the Sui-Tang capital, both of which developed near the two cities built during the Zhou Dynasty.

The second period is when Luoyang was no longer a capital, and urban development was relatively stable. With the political center shifting away, the political importance of the entire Central Plains region diminished. During this period, Luoyang's urban form remained stable, functioning only as the administrative seat of Henan Prefecture and Luoyang County, becoming a typical regional city. This status persisted until the late Qing Dynasty and the early ROC when the city was rebuilt.

From the perspective of related literature, scholars have mainly focused on Luoyang during its time as a capital. On the one hand, capital cities, as key urban

centers, hold significant historical and research value, leading scholars to devote considerable attention to these periods. On the other hand, rich documentation around important cities facilitates in-depth research.

In terms of specific academic studies, both archaeology and history have provided abundant insights into the ancient capital period of Luoyang. The research can be categorized into two types. The first type focuses on the broader history of urban construction in Luoyang as a capital, analyzing why different dynasties chose Luoyang as their capital and identifying the changes and continuities over time. For example, Duan Pengqi's article *Luoyang Gudai Ducheng Chengzhi Qianyi Xianxiang Shixi* (An Analysis of the Phenomenon of Relocation of Luoyang's Ancient Capital Sites) starts with the Zhou Dynasty and analyzes the reasons for the relocations of Luoyang's capital sites throughout the ages from the perspectives of geography, hydrology, and urban space, providing important references for understanding the development and changes in Luoyang's ancient urban form (Duan, 1999). Wang Jun's book *Zhongguo Gudu Jianshe yu Ziran de Bianqian—Chang'an, Luoyang de Xing Shuai* (The Construction of Ancient Capitals in China and Natural Changes—The Rise and Fall of Chang'an and Luoyang) reviews the evolution of the capitals of Chang'an and Luoyang during different historical periods, summarizing the relocation of these capital sites toward more favorable locations for urban development, while highlighting the deterioration of the surrounding natural environment as a key factor in their decline after the Tang Dynasty (Wang, 2000). Zhang Zhongyin's *Dong Han-Bei Wei Shiqi Luoyang Chengshi Xingtai yu Neibu Kongjian Jiegou Yanbian* (The Evolution of Luoyang's Urban Form and Internal Spatial Structure during the Eastern Han to Northern Wei Periods) uses historical geography to discuss the changes in Luoyang's urban form from the Eastern Han to the Northern Wei, offering a comprehensive understanding of the formation and development of Han-Wei Luoyang (Zhang, 2003). Li Jiuchang from Shaanxi Normal University authored *Gudai Luoyang Ducheng Kongjian Yanbian Yanjiu* (A Study of the Spatial Evolution of the Ancient Capitals of Luoyang), which examines the city's urban form during various dynasties, analyzing the reasons for its growth and decline, starting from the natural topography and water systems of Luoyang (Li, 2005).

The second type of research focuses on specific dynasties. For example, Wu Qingzhou's *Han Wei Luoyang Chengshi Fanghong de Lishi Jingyan ji Cuoshi* (Historical Experiences and Measures of Flood Control in Han-Wei Luoyang) discusses the advantages and disadvantages of the water system in Han-Wei Luoyang, helping us better understand the important role water played in the city's

development (Wu, 2012). Zhang Guobin's *Luoyang Qielan Ji Zhong de Chengshi Sheji Wenhua Yanjiu* (A Cultural Study of Urban Design in the Luoyang Qielan Ji) analyzes the urban construction, palace design, and garden planning of Luoyang during the Northern Wei, using the historical, religious, social, and cultural contents recorded in the *Luoyang Qielan Ji (Record of Buddhist Monasteries in Luoyang)* as a basis (Zhang, 2019). Li Shiqi's *Bei Wei Luoyang Cheng Kongjian Yanjiu* (A Study of the Spatial Structure of Northern Wei Luoyang) provides comprehensive materials on the palace city, imperial gardens, and other urban spaces in Northern Wei Luoyang, offering valuable insights into the city's layout (Li, 2019). Chen Yanni's *Chengshi Yu Wenxue: Yi Tangdai Luoyang Jianzhu Jingguan Yu Tangshi Guanxi Wei Zhongxin* (City and Literature: The Relationship Between Tang Dynasty Luoyang's Architectural Landscape and Tang Poetry) uses Tang poetry to explore the architectural and landscape features of Tang Dynasty Luoyang, analyzing the city from both public and private perspectives, providing a novel approach to understanding Tang Luoyang (Chen, 2009). Wang Guixiang's book *Gudu Luoyang* (Ancient Capital Luoyang) focuses on the ancient city of Luoyang, starting with its original site selection and discussing its urban history and construction processes from the Zhou to the Tang dynasties, showcasing the layout features and key buildings of the city during different periods (Wang, 2012). Victor Cunrui Xiong and Ge Zhouzi's *Sui Yangdi yu Sui Tang Luoyang Cheng de Xingjian* (Emperor Yang of Sui and the Construction of Sui-Tang Luoyang) explores the construction process of the Sui-Tang capital of Luoyang, particularly focusing on Emperor Yang's city planning efforts. Combining archaeological findings and historical records, this study examines the city's layout, architectural style, and functional zoning (Xiong & Ge, 2017). Wang Shulin's *Bei Song Xijing Kaogu Yanjiu* (Archaeological Research on the Western Capital of the Northern Song Dynasty) uses modern maps to mark historical traces of the Western Capital of the Northern Song Dynasty, helping to identify the connections between Song Dynasty Luoyang and the present-day city (Wang, 2020).

After the Song Dynasty, Luoyang was damaged by warfare. Although the city was rebuilt during the Jin Dynasty as the Central Capital, the new city was much smaller than before. Over the following centuries, Luoyang ceased to function as a capital. Research on Luoyang's urban construction during this period is less extensive and in-depth, owing to the limited availability of historical records. Studies during this period often rely on local gazetteers. Duan Xiaorong's *Song Yuan Yijiang Luoyang Chengshi Bianqian Yanjiu* (Research on the Urban Transformation of Luoyang from the Song-Yuan Period to the Present) discusses the decline, destruction, and restoration of Luoyang from the Song Dynasty to the

Republic of China (Duan,2005). Additionally, there are specialized studies analyzing Luoyang's urban development in specific dynasties. For example, Zhang Lefeng's *Qingdai Luoyang Chengshi Dili Yanjiu* (Research on the Urban Geography of Luoyang during the Qing Dynasty) examines the development and transformation of Qing Dynasty Luoyang, discussing urban activities such as markets and temple fairs, laying the foundation for research on modern Luoyang (Zhang, 2014).

1.3.3.2 Research on modern Luoyang

During the Republican period, the available documentation related to Luoyang primarily consists of archival records and books that have not been systematically compiled. On one hand, these include historical records, such as the 1946 edition of *Minguo Luoyang Xianzhi* (The County Annals of Republican Luoyang), which has been digitized by the Luoyang Municipal Archives. This record includes details of major events, administrative changes, and notable figures from as early as the Zhou and Qin periods through the Republican era, providing insights into Luoyang's development and transformation in modern times. This rare, incomplete edition, previously privately held, was published in facsimile in 2017 and has now been digitized (Lei & Sun, n.d.).

Additionally, digitized manuscripts from the Republican period, housed in the National Library of China, along with archives from Taiwan's Academia Historica and the Institute of Modern History, provide important resources for studying Luoyang's urban development during this period. For example, the *Shengjing Times*, a Chinese-language newspaper published by Japan after the Russo-Japanese War, is housed in the National Library of China. This paper contains multiple articles describing the situation when the Nationalist government temporarily moved its capital to Luoyang, offering valuable insights into social life at the time. Moreover, the National Library has digitized travelogues such as Ni Xiyang's *Luoyang Youji* (Luoyang Travel Notes) and *Luoyang*, written by the Republican-era writer and traveler. The former recounts Ni's observations of Luoyang's cityscape and scenic spots from a visitor's perspective (Ni, 1935), while the latter discusses the topography and urban landscape of Luoyang during the Republican period (Ni, 1939), providing important references for analyzing the city's morphology and gaining a better understanding of its social life during that time.

In terms of academic research, several papers have examined Luoyang's urban form during this period. For instance, Yan Xiangxiang's paper *Jiyu GIS de Minguo*

(1927–1948 Nian) *Luoyang Laocheng Gongneng Kongjian Buju Yanjiu* (A Study of the Functional Spatial Layout of Old Luoyang during the Republican Era, 1927–1948, Based on GIS) uses GIS technology and historical maps of Luoyang to investigate changes in the spatial layout of the old city during the Ming and Qing Dynasties (Yan, 2021). Ma Shaoping's *Minguo Nanjing Zhengfu Luoyang Xingdu Yanjiu* (A Study of the Nanjing Government's Provisional capital in Luoyang) discusses the background and impact of the Nationalist government's decision to move the capital to Luoyang during the January 28 Incident, as well as the effects this move had on social life in Luoyang (Ma, 2015).

After the founding of the People's Republic of China, local materials on Luoyang's urban development became increasingly complete, with various committees compiling local histories that provide valuable information on the city's growth. For example, *Luoyang Shizhi* (The Annals of Luoyang), edited by the Luoyang Local Chronicles Compilation Committee and published by Zhongzhou Ancient Books Publishing House, offers a detailed overview of Luoyang's post-1949 urban development. *Luoyang Jianzhuzhi* (The Annals of Luoyang Architecture), published by the same publisher, focuses on the city's construction projects and architectural developments. Additionally, the major factories built in Luoyang after the founding of the PRC have compiled their own factory chronicles, such as *Yituo Changzhi* (The First Tractor Factory Chronicle), which records the details of the site selection, construction, and production stages of China's largest tractor factory, providing detailed information for historical research on this period. These factory chronicles often include maps of both factory areas and residential quarters, offering comprehensive resources for the study of this period in Luoyang's history.

In recent years, scholars have increasingly turned their attention to Luoyang's modern urban development, laying the foundation for establishing a continuous perspective on the city's modernization process. For example, Ding Yiping's dissertation *Gongye Yimin yu Luoyang Chengshi De Shehui Bianqian, 1953-1966* (Industrial Migration and Social Change in Luoyang, 1953–1966) examines the population changes that occurred following the industrial development of Luoyang after 1953, highlighting the city's rapid growth as a major industrial center and discussing the transformation of urban life (Ding, 2007). Yan Hongbin's dissertation *Luoyang Jinxiandai Chengshi Guihua Lishi Yanjiu* (A Historical Study of Modern Urban Planning in Luoyang) provides a macro-level overview of the changes in Luoyang's urban planning, summarizing its development during different periods (Yan, 2012). Sun Yuejie's dissertation *Luoyang 156 Gongye*

Yichan Qun Lishi Yanjiu yu Jiazhi Pouxu (A Historical Study and Value Analysis of Luoyang's 156 Industrial Heritage) focuses on the major industrial projects that were part of the "156 Key Projects" implemented in Luoyang during the early years of the PRC, offering detailed discussions on the development of these factories and providing recommendations for the preservation of industrial heritage (Sun, 2016). Li Hao's Book *Ba Da Zhongdian Chengshi Guihua: Xin Zhongguo Chengli Chuqi de Chengshi Guihua Lishi Yanjiu* (Planning of the Eight Key Cities: A Historical Study of Early Urban Planning in the PRC) includes an analysis of Luoyang's post-1949 urban planning, compiling expert interviews and planning documents to provide valuable resources for studying the city's development during the early PRC period (Li, 2016). Fan Hengxin's thesis *Luoyang 1950 Niandai Suyuan Gongye Jianzhu Baohu yu Liyong Yanjiu—Yi Diyi Tuolaji Zhizaochang Wei Li* (A Study of the Preservation and Utilization of Soviet-Assisted Industrial Buildings in Luoyang from the 1950s—A Case Study of the First Tractor Factory) uses the First Tractor Factory as a case study to examine the development of Soviet-assisted industrial projects in Luoyang and to analyze the characteristics of Soviet architectural styles (Fan, 2020). Sang Liyan's thesis *Gongye Yongdi Kuozhan Xia Luoyang Chengshi Kongjian Xingtai Yanbian Yanjiu* (A Study of the Evolution of Luoyang's Urban Spatial Morphology under Industrial Expansion) focuses on industrial land use, discussing the city's development between 1953 and 2019, and highlighting the relationship between the expansion of industrial land and changes in urban morphology (Sang, 2021).

1.3.4 Summary of literature review

Through a review of existing research closely related to this study, the positioning of this research can be clearly defined. In the field of urban history, foreign scholars have had an earlier start and have achieved diverse and rich research outcomes. These range from discussions of the macro historical patterns of urban development to specialized analyses of individual cities. Moreover, the research spans multiple academic disciplines, offering a comprehensive view of the complexity and diversity of urban development. Although research on urban history in China began later, scholars have gradually optimized Western theories and methods by integrating them with China's specific circumstances, steadily expanding the scope of urban history research in China.

Nonetheless, the existing body of work shows that research on Chinese urban history has predominantly focused on ancient cities, with modern and contemporary urban studies appearing somewhat lacking. Furthermore, the research tends to focus

on major cities, with insufficient attention paid to general cities. Trans-disciplinary and multi-perspective approaches also remain underdeveloped. In recent years, although research on urban history has shown a shift from central cities to regional ones, incorporating an increasing number of ordinary cities into the research scope, there is still much work to be done.

Urban morphology is closely linked to urban history research due to its focus on the historical trajectory of urban development. Over several decades of development, urban morphology in the West has evolved from the original Muratori and Conzen schools, with ongoing exchanges between these schools and contributions from scholars across various countries. The advancement of digital technologies has also continuously expanded the theories and practices of urban morphology. At the same time, like urban history, urban morphology has exhibited a strong interdisciplinary nature and, in recent years, has shown a trend towards interdisciplinary development. Although urban morphology research in China began late, significant progress has been made in recent years. Starting with the application of classical morphological methods from abroad, Chinese scholars have increasingly adapted these approaches to local conditions, effectively promoting the construction of a theoretical framework for urban morphology research in China and laying the foundation for its application in various urban studies.

The work of both foreign and Chinese scholars in these two research fields provides ample reference for this study. Focusing on the theme of modern and contemporary urban research in Luoyang, it becomes clear that several areas require further refinement or completion. First, most existing research has concentrated on Luoyang during its time as a capital in ancient history. This research includes both cross-dynastic overviews and specialized studies of individual dynasties or historical periods. However, research on Luoyang outside of its capital status, especially during the modern and contemporary periods, appears somewhat fragmented in continuity.

Secondly, the period from the 1910s to the 1960s, which is the focus of this study, marks a critical phase in Luoyang's transition from a traditional to a modern city. The modern urban framework of Luoyang was formed during this period. However, no dedicated research has been conducted on Luoyang's urban development during this time. Existing papers and monographs tend to focus on specific periods or regions, such as the Jianxi Industrial Zone after the founding of the PRC, lacking continuity in research over time and comprehensiveness in spatial analysis. Alternatively, this period is sometimes treated as part of broader studies

on contemporary urban planning, but the level of detail is insufficient, and the formation of urban characteristics has not been thoroughly explored. Overall, existing studies have not clearly articulated the significance of the two phases of “building a new urban area near the old part of the city” between the 1910s and 1960s, nor have they demonstrated the relationship between the historical process, the development of Luoyang’s unique urban spatial structure, and the urban transformations behind it.

The “history-urban form-transformation” framework that this study seeks to construct aims to address the gaps in research on modern and contemporary Luoyang. By using tangible elements such as urban and architectural forms to illustrate the city’s historical development, this study also hopes to improve the corresponding urban morphology research methods. To achieve this goal, several aspects of modern and contemporary Luoyang’s documentation need to be further explored and organized. For example, telegraph records and valuable aerial photographs stored in historical archives, when combined with current survey maps, can help reconstruct the development trajectory of Luoyang since modern times. Additionally, a more comprehensive perspective needs to be established—one that fully and multidimensionally presents the city’s historical changes, analyzes the spatial characteristics of the city during different eras, and provides a basis for understanding the changes in social life.

To fill the gaps in modern and contemporary research on Luoyang, it may be necessary to return to the fields of urban history and urban morphology. Urban history reveals the city as a vessel for everyday life, encompassing customs, economics, politics, and more. Whether approached from a macro perspective or a micro one, urban history provides a vital window into understanding social changes and national development. The interdisciplinary nature of urban history, which has grown stronger since the turn of the century, positions it as a multidimensional discipline that must connect history, sociology, architecture, economics, and urban planning. Meanwhile, urban morphology, especially the process-typology method pioneered by the Muratori School, is closely related to the tangible urban and architectural forms that reflect a city’s historical development. By comparing morphological elements across different periods, it can reveal social changes over time and provide us with an “operational history” that can guide contemporary urban planning and preservation.

In conclusion, for the study of modern and contemporary Luoyang’s urban history, utilizing the research methods from urban morphology and history can

clearly illustrate the city's morphological changes during this period. This approach helps establish a continuous perspective on Luoyang's development and contributes to our overall understanding of the changes and continuities in its urban growth. Furthermore, as a "non-central" city in China, Luoyang's general characteristics can serve as a case study for understanding the broader patterns of modern urban development in China.

1.4 Research object, methods and framework

1.4.1 Research Object

(1) Definition of the Geographical Scope

The research object of this study is the of Luoyang's urban form changes and urban transformation between the 1910s and the 1960s. Geographically, the "urban" scope of Luoyang in this study refers to the urban areas where the administrative offices of Henan Prefecture (河南府, Henan Fu) during the Qing Dynasty, Luoyang County (洛阳县, Luoyang Xian) during the ROC period, and Luoyang City (洛阳市, Luoyang Shi) after the founding of the PRC were located. This scope corresponds to the urban area that serves as the administrative center of today's Luoyang prefecture-level city. It does not include the territories under the jurisdiction of Henan Prefecture during the Qing Dynasty or the counties under the jurisdiction of today's Luoyang prefecture-level city.

From the perspective of administrative division changes, the Qing Dynasty adopted a three-tier administrative structure of province-prefecture-county (省-府-县). After the founding of the ROC, the administrative division of abolishing prefectures while retaining counties (废府存县) led to a two-tier structure of province-county (省-县). During the Republican period, the administrative unit of "city (市, Shi)" was introduced in some well-developed and populous urban areas, which included cities directly governed by the Executive Yuan (行政院) as well as county-level cities (县级市) governed by provincial administrations. After the founding of the PRC, administrative divisions were restructured again, designating "city" as administrative units separated from counties in areas with certain population thresholds. "Luoyang City," as an administrative unit, officially emerged during this period.

Although administrative divisions have evolved, they do not affect the definition of the research scope in this study. In the traditional urban structure of the Qing Dynasty, the city wall clearly delineated Luoyang's urban area, comprising the area within the city walls and the surrounding suburban gate regions. During the Republican period, government notices and engineering plans explicitly defined Luoyang's urban boundaries, including the old city area (the old town from the Qing period) and the Xigong area. In the early years of the PRC, Luoyang's urban boundaries can be referred to in relevant planning documents, encompassing the old city, Xigong, and Jianxi areas. The evolving urban forms, boundaries, and characteristics of these expanding urban areas since modern times constitute the research object of this study.

(2) Selection of the Research Period

Regarding the selected time period, the 1910s mark the beginning of this study because they represent the era when China transitioned from feudal rule to a republic. Although social changes during this period were relatively slow, the nominal end of feudal rule symbolized the start of a new phase. Situated in the Central Plains, Luoyang's geographic location meant it was relatively insulated from direct impacts of foreign ideologies, cultures, and economic influences. However, the modernization processes of the late Qing Dynasty still had a presence in Luoyang, including social institutional changes brought by the late Qing reforms and technological developments under the "railway to strengthen the nation" ideology, exemplified by the construction of the Luoyang-Kaifeng Railway. The railway, as a more conspicuous factor influencing urban development, is regarded in Luoyang's planning history as the starting point of its modernization. In 1914, under the initiative of Yuan Shikai, Luoyang began its first phase of "building a new urban area near the old part of the city" with the construction of the Xigong military camp. Thus, both national-level reforms and specific local events in Luoyang justify using the 1910s as the starting point for Luoyang's modern urban development.

The 1960s are chosen as the endpoint because, by this time, China had completed its First Five-Year Plan (一五计划) and Second Five-Year Plan (二五计划), with the major industrial enterprises in Luoyang largely established. The city's modern spatial structure had essentially taken shape. By the mid-to-late 1960s, as the country entered a period of political turmoil, the pace of urban development in Luoyang slowed. Even so, the nearly 20 years of construction following the

founding of the PRC laid the foundation for Luoyang's modern urban development and continued to influence its growth during the reform and opening-up period.

1.4.2 Research Methods

(1) Urban Morphology Methods

This research aims to combine the study of urban morphology with urban history, making urban morphology methodologies a key source of inspiration for this study. Over time, urban morphology has developed various approaches, including historical-geographical methods and process typology methods. Although these methods originate from different disciplinary backgrounds, they share common features, such as analyzing urban morphology by layers and focusing on how elements like cities and buildings shape urban form.

This study draws on existing urban morphology research to analyze urban form characteristics and identify morphological elements. It then adapts these approaches to the specific context of modern and contemporary Luoyang's urban development. By comparing these identifiable elements, the study seeks to examine social changes in Luoyang during the two waves of "building a new urban area near the old part of the city", contributing to the proposed "history-urban form-transformation" framework.

(2) Historical Map Translation Method

Maps are critical to the study of urban morphology, and it is essential to organize collected maps and produce interpretable urban morphology maps. The historical maps gathered for this study are digitized images or digitally processed. By using GIS software for georeferencing, these historical maps can be aligned with modern map coordinates, ensuring that the translated morphological maps are relatively accurate.

This study has mapped the urban morphology of Luoyang from the 1910s to the 1960s. It has also produced morphological maps and analyses of the old city area, the Xigong district, and the Jianxi district, which formed under the context of "building a new urban area near the old part of the city." These maps provide an important basis for the application of urban morphology methods.

(3) Document Analysis Method

This research collected relevant local chronicles, archives, anthologies, government bulletins, telegrams, historical photographs, academic papers, and monographs from various sources and categorized them systematically. These materials support discussions of urban morphology in specific chapters and provide important references for analyzing social change in Luoyang. Additionally, various urban images from different periods (see appendix), including historical maps, aerial photographs, and remote sensing images, were organized to support the drawing of urban morphology maps and analysis of urban form.

(4) Interdisciplinary Research Methods

The city is a complex research subject involving not only tangible physical spaces but also intangible elements such as politics, economics, society, and culture. Accordingly, urban studies should take a multifaceted approach. While the focus of this study is on the urban morphology and development of modern and contemporary Luoyang, the research also engages with disciplines such as sociology and architecture. The inclusion of other fields adds complementary methods and perspectives, making the research more comprehensive and better illustrating the close connections between “history-urban form-transformation.”

Through interdisciplinary methods, this study conducts a comprehensive analysis of Luoyang’s urban morphological changes and spatial structure, highlighting the multiple driving forces behind these changes and their impact on the socio-spatial relationships. This ultimately emphasizes the causes, characteristics, and significance of Luoyang’s modern urban morphology.

1.4.3 Research framework

This study aims to establish a research framework based on the “history-morphology-transformation” approach. For Luoyang, the two phases of “building a new urban area near the old part of the city” led to a discontinuous urban morphology. These morphological formations were shaped by different historical stages of the city’s development. On this basis, using the concepts and methods of urban morphology, it is possible to deconstruct the elements that constitute urban morphology and clarify the material spatial characteristics of the city at different historical stages. Following this approach, Chapters 2, 3, and 4 of this dissertation will analyze the urban morphology and its elements during the Late Qing Dynasty,

the Republic of China, and the early years of the People’s Republic of China, progressing from history to morphology.

Building on these discussions, Chapter 5 will shift from morphology to transformation, comparing the different urban forms to discuss Luoyang’s urban transformation during this period. The changes in morphological elements reflect the urban ideals under different historical contexts and embody the modernization process of Luoyang’s urban development. At the same time, the morphological differences also deeply reflect the social transformations, with related discussions going beyond purely technical aspects. This will clarify the characteristics of Luoyang’s urban transformation in modern times. Furthermore, Chapter 6 of this study will further explore the lasting impact of urban transformation in the early

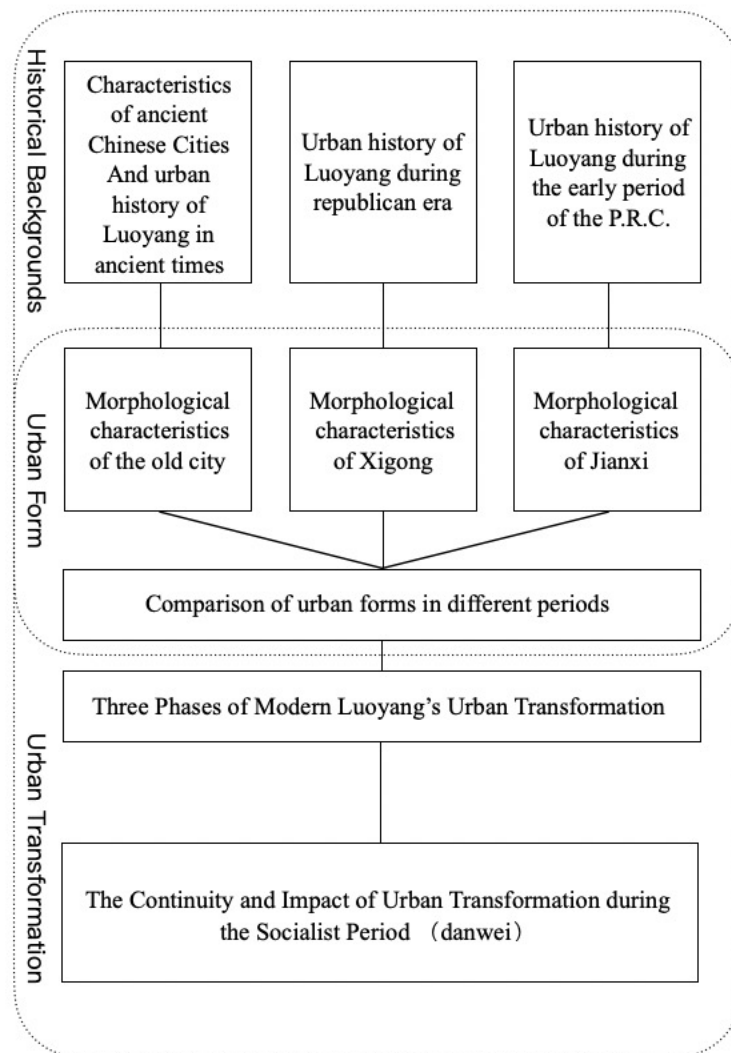


Fig. 1-1 Research framework

years of the People's Republic of China. Compared to the Late Qing Dynasty and the Republic of China periods, this stage saw a combination of socialist ideology and traditional social governance, which reshaped the modern urban space of Luoyang through the unique "danwei" (work unit) organizational model.

Chapter 2

Analysis of the traditional urban form of the old city in the late Qing dynasty

The Late Qing Luoyang City, referred to as the old city(老城) of Luoyang, serves as the starting point for modern Luoyang's development, where new urban areas were constructed near the old city (Figure 2-1). Its history can be traced back to the city rebuilt by the Jin Dynasty (金) on the ruins of the Song Dynasty (宋) Luoyang City,¹ with subsequent dynasties maintaining its general layout. As a product of ancient urban development, the old city reflects the characteristics of traditional urban form.



Fig. 2-1 Illustration of the location of Luoyang old city

¹ Song Dynasty inherited the city built by Sui Dynasty. During the Sui and Tang Dynasties, Luoyang served as a Capital, exemplifying classical principles ancient Chinese urban planning.

This chapter will begin by discussing the urban development of ancient Luoyang, providing an overview of how the city's advantageous geographic position, shaped by its natural landscape, contributed to its long-standing history as a capital. This historical background, along with the relationship between the old city and its iterations during the Jin, Yuan(元), Ming(明), and Qing Dynasties, is key to understanding the old city of Luoyang. Building on this foundation, the chapter will further analyze the characteristics and underlying factors of traditional Chinese urban form, focusing on how Luoyang's unique history and geography influenced the structure and features of the old city. Additionally, it will explore and interpret the specific urban form elements present in the old city.

2.1 The history of the old city in ancient times

Luoyang is one of the oldest capital cities in Chinese history, with its history as a capital dating back to the Xia Dynasty.² The Erlitou site (二里头), located in the nowadays Yanshi District of Luoyang, reveals the layout as a capital during the Xia Dynasty. Later, the construction of the city of Luoyi (洛邑) by Zhougong (周公, Duke of Zhou) further solidified Luoyang's political and economic status. Over the following millennia, Luoyang served as the capital of over ten different dynasties,³ witnessing the rise and fall of regimes and the ebb and flow of society. (Li, 2005, pp.26-29)

During the Song and Jin Dynasties, due to changes in the natural environment of the Central Plains and the shift of the economic center, Luoyang was no longer used as an imperial capital. However, the urban construction carried out by previous dynasties continued to exert a long-term influence on Luoyang's urban development. This influence is primarily reflected in two aspects. First, Luoyang's unique geographical and environmental advantages continued to be prominent. Surrounded by mountains, with favorable hydrological conditions and fertile land, Luoyang remained a prime location for capital construction for a long time, leaving

² In 1983, renowned Chinese archaeologist Mr. Li Xiandeng, based on the results of archaeological excavations at the Erlitou site, pointed out that the Erlitou site marks the earliest location of ancient Luoyang, making Luoyang one of the oldest capitals in Chinese history.

³ There are various perspectives regarding the dynasties that established their capitals in Luoyang. In *Gudai Luoyang Ducheng Kongjian Yanbian Yanjiu* (A study on the spatial evolution of ancient Luoyang capitals), Li Jiuchang highlights seven main viewpoints: the "Nine Dynasties Theory," "Ten Dynasties Theory," "Eleven Dynasties Theory," "Twelve Dynasties Theory," "Thirteen Dynasties Theory," "Fifteen Dynasties Theory," and the "Eighteen Dynasties Theory." For more details, refer to the source.

behind a rich history of capital city building. Even during periods when Luoyang functioned as an ordinary city (a prefecture level city),⁴ it was still considered a strategic military location and was recognized as one of the birthplaces of Chinese civilization. Luoyang's further development during the Republican era and the early years of the PRC was partly due to its advantageous geography and the government's appreciation of its deep historical and cultural significance.

Secondly, the capital city planning and construction in Luoyang had a lasting impact on the city's future urban layout. From the Zhou Dynasty to the Tang Dynasty, although Luoyang's capital sites frequently shifted, the city saw the creation of massive, world-class cities, such as the Northern Wei Luoyang City and the Sui-Tang Luoyang City. After the Song Dynasty, as Luoyang's political status declined, the city gradually fell into decay. However, in terms of urban space, it maintained a certain degree of continuity, as reflected in the layout of Luoyang's old city.

According to the *Henan Prefecture Annals*(河南府志) compiled during the Qianlong reign of the Qing Dynasty,

“Duke of Zhou established Luoyi, selecting a site east of the Jian River and west of the Chan River through divination. When the Qin dynasty established the prefecture and county, they were located in Chengzhou. During the Sui dynasty, the county government was relocated to Guangtong Fang, which corresponds to the present-day city. The Jin, Yuan, Ming, and Qing dynasties all adhered this historical precedent.” (Sun, n.d.)

These few lines summarize more than 2,600 years of urban history in Luoyang. The construction of Luoyi by Duke of Zhou laid the foundation for Luoyang's role as a capital, and the development of the city throughout subsequent dynasties largely unfolded near the Jian and Chan rivers. The city during the Jin, Yuan, Ming, and Qing periods evolved from the Sui-Tang Luoyang City, which was reconstructed by the Jin Dynasty in a corner of the former Sui-Tang Luoyang city.

⁴ During the Qing Dynasty, cities could be divided into four levels: the capital, provincial capitals, prefectural cities, and county-level cities, corresponding to the three-tier administrative divisions of province, prefecture, and county. Among them, the only capital city was Beijing, while Shengjing (present-day Shenyang), as the starting point of the Qing regime, also held the status of an secondary capital. There were over 20 provincial capitals, approximately 200 prefectural cities, and about 1,300 counties. Luoyang, as the seat of Henan Prefecture and Luoyang County, was classified as a prefectural-level city.

Over the more than 600 years following the Jin Dynasty, Luoyang ceased to function as an imperial capital, and its urban form remained stable.

2.1.1 Overview of Luoyang's geographical features

2.1.1.1 Major scale: A suitable environment and central positioning

(1) Favorable natural environment

Geographically, China's terrain is divided into three steps. As shown in the topographic map of China (Figure 2-2), from west to east, the steps are: the first step with an average altitude of over 4,000 meters, including the Qinghai-Tibet Plateau; the second step with an altitude of 1,000-2,000 meters, including the Loess Plateau and Yunnan-Guizhou Plateau; and the third step, with an altitude mostly below 500 meters, encompassing regions like the Northeast Plain, North China Plain, and the Yangtze River Delta Plain. Influenced by terrain and monsoon, the low-altitude third step is prone to heavy rainfall and flooding, while the second step is characterized by arid conditions unsuitable for agriculture, and the first step's

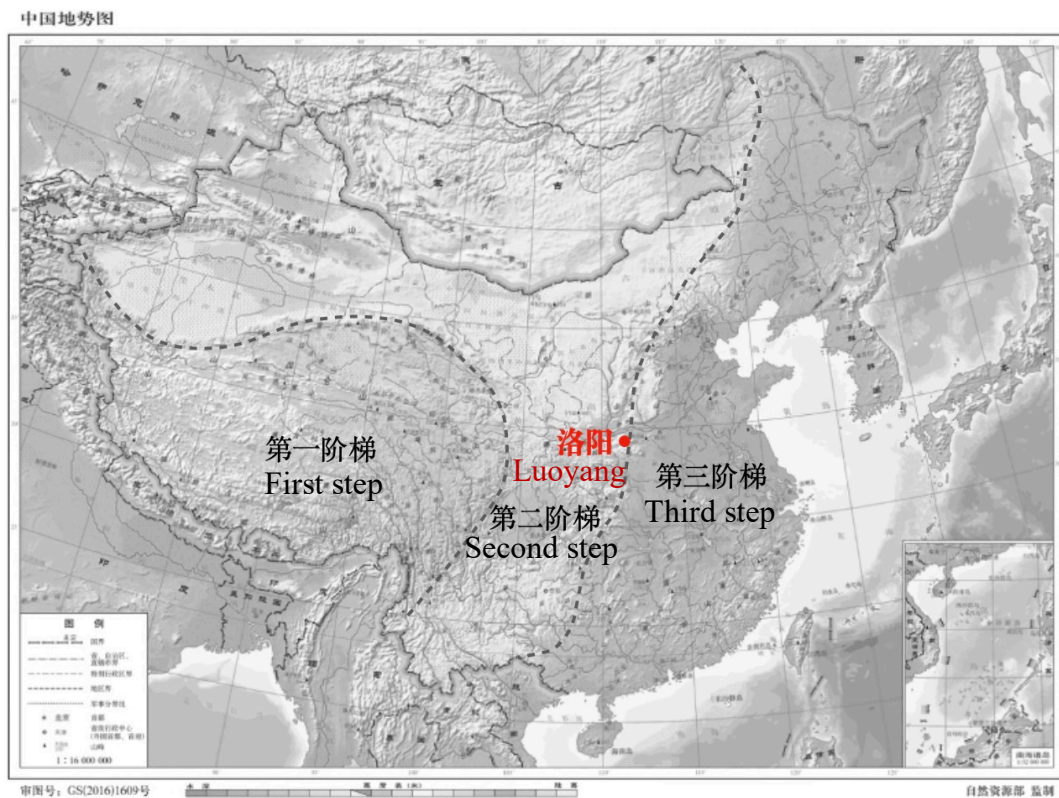


Fig. 2-2 The Luoyang is located at the intersection of the second and third steps. (Source: the website of the China central government)

cold climate hampers human activity. Thus, early human settlements were typically located at the transitional zones between the second and third steps, such as the middle and lower reaches of the Yellow River and Yangtze River, areas with favorable temperatures, accessible water, and open flatlands. Even during primitive societies, these regions provided suitable conditions for agriculture and habitation. Luoyang, situated at the transition zone between the second and third steps, benefits from a geographical environment ideal for human activity.

(2) The concept of centrality in ancient geography

According to *The Records of the Grand Historian (Shiji, 史记)*, it is said that Yu the Great (dayu, 大禹) divided the land into nine provinces and opened nine routes. (开九州, 通九道) Luoyang was situated in the central province of Yuzhou, as mentioned in the geographical division of the Nine Provinces delineated by rivers and mountains in *The Tribute of Yu (yugong, 禹贡)* (Figure 2-3). According to Chinese archaeologist Yan Wenming, the prehistoric cultural landscape of China can be likened to a large multi-petaled flower, with the six provinces in the Yellow River Basin forming the Central Plains Cultural Area at the heart, eventually



Fig. 2-3 The Tribute of Yu: Map of the Nine Provinces. Luoyang located in Yuzhou, which is the center of nine provinces. (Source: Zhonguo Lishi Dituce)

becoming the dominant region. This area developed into the core of a large political

entity, the Xia Dynasty, with the Heluo Region (河洛地区) as its center. (Yan, 1987, pp.38-50)

The Heluo Region can be interpreted in both broad and narrow senses. Broadly, it refers to the expansive area between the Yellow River and Luo River, extending from Zhongmu (中牟) in the east to Tongguan (潼关) in the west. (Li, 2005, p.76) Narrowly, Luoyang lies at the heart of this region, with its flat terrain and fertile land making it synonymous with the Heluo Region. Thus, Yuzhou is the center of the Nine Provinces, with the Heluo Region as its core and Luoyang at the center of the Heluo Region. This geographic centrality of Luoyang is reflected in historical records, such as Sima Qian's statement in *The Records of the Grand Historian*: "Luoyang is the center of the world, with equal paths for tribute coming from all directions" (Li, 2005, p.98). Ban Gu also mentions in *Two Capitals Rhapsody* (*Liang Du Fu*, 两都赋): "Measured by the sundial, it is neither too short nor too long" (Ding, 2007, p.98).

(3) The tradition of choosing the center to establish the nation (择中立国) to strengthen Luoyang's positional importance

Beyond its natural environment and traditional notions, Luoyang's centrality was further reinforced by the ancient concept of choosing the center to establish the nation. As mentioned in *The Annals of Lyu Buwei* (吕氏春秋): Choosing the center to establish the nation, reflecting a tradition of capital city construction from the early class society. This tradition can be explained through both astronomical and geographical lenses. The ancients revered the heavens, and the heavens have nine fields, the earth has nine provinces. The emperor, as the Son of Heaven (天子), needed to symbolize this order by establishing the capital in a location corresponding to the celestial center, the North Star, which is fixed in the sky and symbolizes the celestial center. Establishing the capital in the earthly center reflected the emperor's divine mandate, enhancing the capital's prestige. (Wang, 2000)

Practically, choosing the center also allowed for better organization, control, and utilization of the surrounding regions. Luoyang's geographic centrality enabled the dynasties ruling from here to effectively manage their territories, ensuring stable governance. Combining tradition with practicality, Luoyang became an early focal point for imperial attention, with its advantageous natural environment, alignment with ritual norms, and centrality for governing the empire (Li, 2005, p.95).

2.1.1.2 Intermediate scale: A unique mountain-river landscape creating a natural defensive barrier

In ancient Chinese urban planning, capitals were chosen with attention to geography, climate, and defense, favoring locations with natural defensive features, fertile land, and ample water resources. The geography surrounding Luoyang, characterized by mountains and rivers, provided these essential factors for capital construction.

Luoyang's geographical context can be summarized as having mountains(山), rivers (川), and strategic passes (关). These elements not only created natural defenses but also ensured abundant water resources, making Luoyang a naturally fortified location (Figure 2-4).

(1) Mountains: The encircling Yiluo Basin

To the north of Luoyang lies the Mang Mountain, part of the Xiao Mountain range, while to the south are the Xiang and Ying Mountains, flanking the eastern and western sides of Yique Pass. These mountains, part of the larger Song and Xiong'er Mountain ranges, form a natural barrier. To the west are hilly areas with elevations between 200-300 meters, while to the east, the terrain lowers, with elevations mostly below 150 meters. These mountains form the Yiluo Basin, which has nurtured the development of the Heluo culture.⁵

(2) Rivers: Five rivers flowing through Luoyang

The Yellow River, flowing to the north of Mang Mountain, is the largest river in Luoyang. Within the city, the Luo River, Jian River (also called Gu River), Chan River, and Yi River flow, providing abundant water resources. The Luo and Yi Rivers, tributaries of the Yellow River, are particularly vital for the city's development. The sediment brought by the Yi and Luo Rivers has continually raised and expanded the Yiluo Plain. (Duan, 1999, p.41)

(3) Passes: Natural defensive barriers formed by mountains and rivers

The combination of mountains and rivers creates natural defensive passes. These passes, such as Mengjin, Xiaopingjin, Heishi, Xuanyuan, and Hangu, serve

⁵ Heluo culture refers to the culture developed in the Heluo region. The Heluo culture is an integral part of Central Plains culture and serves as the origin and core of Chinese civilization.



Fig. 2-4 Geographical Features of the Area Surrounding Luoyang

as strategic entry points to the Yiluo Basin, making them crucial military strongholds.

This mountain-river-pass geographic structure explains why many dynasties favored Luoyang as their capital, particularly before the Song Dynasty. As ancient texts like *The Book of Changes* (易) suggest, “The rulers create strategic defenses to protect their country,” and *Guanzi* (管子) also advises, “Capitals should be established not in low plains, but on elevated areas near rivers, where water is sufficient but not too close to flooding.” Thus, Luoyang’s location in the Yiluo Basin made it a prime site for capital construction, offering strategic and defensive advantages.

Additionally, Luoyang’s position between the Guanzhong and North China Plains, along with its natural defenses, further enhanced its strategic importance. As a result, Luoyang became a critical node in east-west transportation, a vital factor in its status as a military stronghold throughout history.

2.1.1.3 Small scale: favorable conditions for production and daily life

Beyond its macro- and meso-scale advantages, Luoyang also offers favorable conditions for agricultural production, which played a key role in supporting economic development and urban construction throughout ancient Chinese history. During the Shang (商) and Zhou (周) Dynasties, agricultural activity was concentrated in the lower reaches of the Fen, Yiluo and Qin Rivers, areas that were

both early agricultural centers and economically advanced regions. (Li, 2005, p.79) Luoyang's location within the Yiluo River region provided it with ideal conditions for agricultural development, ensuring a stable foundation for the city's growth.

Ancient Chinese city planning required proximity to water sources, as well as fertile land for agriculture, especially for capitals that needed to support large populations. Dynasties that built their capitals in Luoyang often chose sites near the Luo River, with North Wei and Sui-Tang era Luoyang cities being constructed in relatively elevated, flat areas between the Luo River and Mang Mountain. This reduced the risk of flooding while ensuring sufficient water resources for residents and facilitating material transport via the rivers.

In addition to water resources, Luoyang's fertile soil and favorable climate conditions ensured robust agricultural production, supporting the city's population growth and urban development. The surrounding mountains also provided abundant natural resources like timber and minerals, ensuring the materials needed for construction and handicraft industries.

In summary, Luoyang's geographical location made it an ideal site for imperial capitals. Across large, intermediate, and small environmental scales, Luoyang consistently offered the essential elements for establishing and sustaining a capital city.

2.1.2 Overview of the capital history of Luoyang

From the Shang and Zhou dynasties to the Song and Jin periods, Luoyang served as the capital for over ten dynasties, with most of these capitals concentrated along the banks of the Luo River, creating the renowned scene known as "Five Capitals Converge in Luoyang (五都荟洛)" (Figure 2-5). Each relocation of the capital witnessed the progression of history and the enhancement of urban construction, marking the rise and fall of Luoyang city. A brief review of this historical context helps establish a deeper understanding of the development of ancient Luoyang and provides valuable insights into the historical significance of Luoyang old city within this broader urban evolution.

2.1.2.1 Early development: From semi-historical accounts to the Zhou Dynasty

The origins of urban construction in Luoyang can be traced back to the semi-historical period, with legends such as the "Longma Bearing a River Map" during the time of the Three Sovereigns and Five Emperors, and the story of Yellow

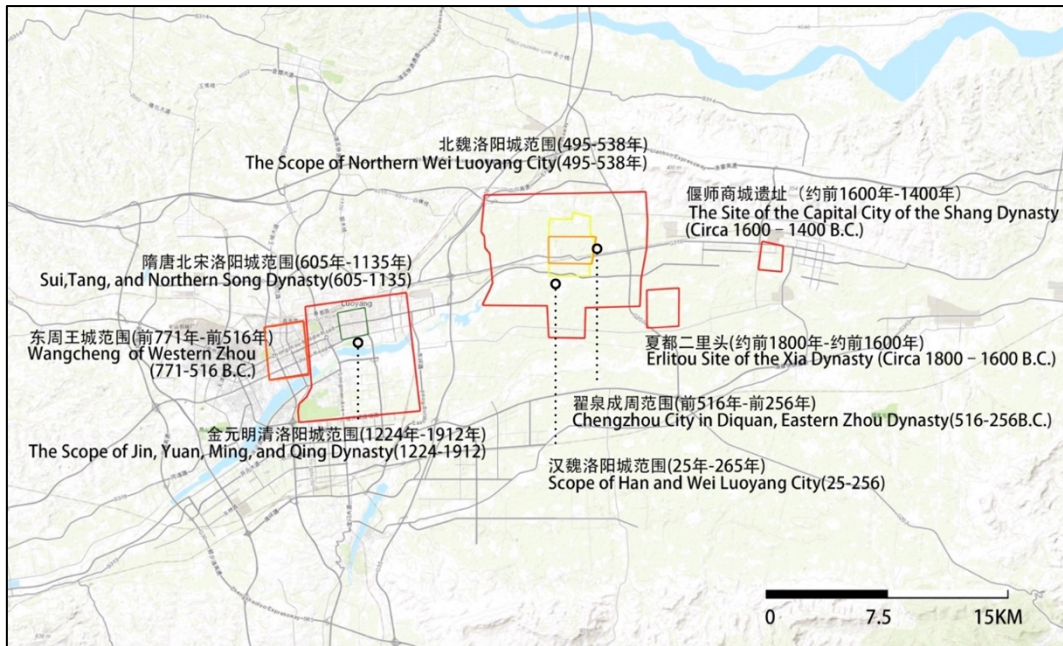


Fig. 2-5 The locations of Luoyang's cities across different Dynasties.

Emperor's great-grandson, Di Ku, establishing his capital in Bo (believed to be modern-day Yanshi, near Luoyang). Although these oral traditions are difficult to verify, and the existence of capital cities during the Three Sovereigns and Five Emperors period is questioned by scholars—arguing that these “capitals” were more likely tribal centers or large chiefdoms—these stories still serve as evidence of Luoyang's long history of urban development (Li, 2005, p.35).

From verifiable historical records, Luoyang's urban construction history can be traced back to the Xia Dynasty. Before the 1950s, research on Luoyang's history as a capital typically began with the Zhou Dynasty, with scholars believing that the establishment of Luoyi was the starting point of its urban construction. However, since the 1950s, archaeological discoveries have expanded this scope. In the 1950s and 1980s, archaeologists discovered sites in Yanshi, Luoyang, dating back to the Xia and Shang Dynasties, further verifying records that these Dynasties-built capitals near Luoyang. (Gu, 2019)

During the Zhou Dynasty, Luoyang's urban scale expanded, and construction activities became more frequent. In the 11th century BCE, at the founding of the Zhou Dynasty, Duke of Zhou, under King Wu's orders, established Chengzhou and Luoyi in Luoyang. (Guangming ribao, 2013) This laid the foundation for Luoyang's development for the following centuries. Both Han and Northern Wei Dynasties'

Luoyang cities were developed on the site of the Eastern Zhou capital, Chengzhou, located east of the Chan River. This site later became Luoyang County under the Qin Dynasty. Meanwhile, the “Wangcheng” of the early Eastern Zhou, located west of the Chan River, became Henan County during the Qin and Han Dynasties, overlapping with parts of the later Sui-Tang Luoyang city. (Li,1980) In summary, compared to the Xia and Shang Dynasties, the Zhou Dynasty saw more frequent urban construction in Luoyang, with the city’s scale and structure maturing, further emphasizing Luoyang’s role as the nation’s political center.

2.1.2.2 Growth period: The development of Luoyang from Han to Wei Dynasties

After the fall of the Zhou Dynasty, Luoyang once again became a capital during the Eastern Han Dynasty. In the first year of Jianwu (25 CE), Emperor Guangwu of Han, Liu Xiu, ascended the throne and established Luoyang as the capital. Construction activities immediately followed, expanding the existing city based on the previous Zhou, Qin, and Western Han city structures. Markets, gardens, and temples were built, along with ancestral temples (宗庙) and altar of earth and grain (社稷坛) outside the city (Wu, 2019, p.68). In the second year (26 CE), Emperor Guangwu officially moved the capital to Luoyang, marking its replacement of Chang’an as the national capital.

At the end of the Eastern Han period, Luoyang was destroyed. In 189 CE, Dong Zhuo entered Luoyang, deposed the young emperor, and enthroned a new one. The following year, under the threat of allied forces, Dong Zhuo forced the emperor to relocate to Chang’an and burned down Luoyang’s palaces and residences before his departure (Fan, n.d.). When the state of Cao Wei (曹魏) established its capital in Luoyang, it rebuilt palaces on the site of the former Eastern Han city. During the reign of Emperor Ming of Wei, further construction took place in 235CE, including the construction of the Luoyang Palace, Zhaoyang Hall, and Taiji Hall. This urban structure remained through the Jin Dynasty, hence the name Wei-Jin Luoyang city.

During the chaotic “Five Barbarians Invasion (五胡乱华),” Luoyang frequently suffered from warfare due to its strategic location, fertile land, and long-standing political significance. Various regimes fought over it, causing significant damage. For example, in the “Disaster of Yongjia (永嘉之乱)” in 311 CE, the Xiongnu’s Liu Cong captured Luoyang, sacked the city, and burned the palace.

Luoyang's next period of urban flourishing came during the Northern Wei Dynasty, when Emperor Xiaowen decided to relocate the capital to Luoyang. In 495 CE, the new Luoyang city was officially completed. (Wei, 1974) This version of Luoyang concentrating the palaces in the location of the former Han Northern Palace (Qian, 2003) and constructing a palace gate on the original site of the Wei-Jin Luoyang city's Changhe Gate (阊阖门). The city had a clear city axis from Changhe Gate to Tongtuo Street (铜驼街) and Yuanqu (圜丘). Additionally, Northern Wei expanded the outer city walls, forming a triple-layered structure of palace city, inner city, and outer city. Inside the city, neatly arranged residential wards were planned, along with a clear road system. The city also greatly improved its water management capabilities by enhancing river channels for water supply, drainage, flood control, and transportation, all while incorporating scenic water features.

Overall, the Han-Wei Luoyang city, originating from the Eastern Zhou site, reached its zenith during the Northern Wei Dynasty. It is considered a capital that bridged the past and the future, influencing the capitals of later dynasties, including the Tang Dynasty. Noted historian Chen Yinke remarked that “the unique innovations of the Northern Wei Luoyang city influenced the layouts of later capitals like the Sui Daxing city and the Tang Chang'an city” (Chen, 1982).

2.1.2.3 Peak period: Sui-Tang Luoyang and the Northern Song's western capital

Sui-Tang Luoyang City represents another zenith in the history of Luoyang's urban construction and marks a significant transformation in Chinese capital city planning (Xiong & Ge, 2017, 1-2). In the fourth year of Renshou (604 CE), Yang Guang ascended the throne as Emperor Yang of Sui (604-617 CE). To strengthen control over the country, Emperor Yang initiated the construction of Dongdu (Eastern Capital) in Luoyang (Wang, 2000). The project began in March of the first year of Daye (605 CE), and a new Luoyang city was built about 18 li⁶ west of the Han-Wei Luoyang city. This grand world-class city featured systematic planning, site-specific construction, and advanced water transport systems while also emphasizing landscape design.

⁶ The term “li” refers to an ancient Chinese unit of length, whose measurement varied across different dynasties. Based on this calculation, 18 li approximately corresponds to a distance of 6 to 10 kilometers today, which aligns with the estimated distance between the Sui-Tang Luoyang City and the Northern Wei Luoyang City.

As a newly constructed capital, Sui Luoyang had the advantage of starting from a clean slate without needing to integrate previous structures. Despite this, Sui Luoyang did not rigidly follow traditional palace-city placement along the northern axis. Instead, the palace was located in the northwestern higher terrain, providing better flood protection and defensive capabilities. This decision exemplifies an adaptive approach to construction. According to *Miscellaneous Records of Daye*(大业杂记):

“The Eastern Capital city had a circumference of 73 li and 150 bu,⁷ extending westward to Wangcheng, eastward beyond Chan and Jian Rivers, southward across the Luo River, and northward beyond the Gu River. The palace city was 5 li 200 bu wide from east to west and 7 li from north to south” (Du, n.d.).

In the city, apart from the imperial palace, Sui Luoyang was similar to Northern Wei Luoyang in that it divided the urban area into “wards” with residential functions and three “markets” designated for trade.

“There were ninety-six wards in the southern part of Luoyang and thirty wards in the northern part. The wide avenues and narrow streets crisscrossed symmetrically”.

“The Eastern Capital’s eastern market was called Fengdu (丰都), the southern market Datong (大同), and the northern market Tangyuan(通远).”

Compared to the Northern Wei Luoyang, where only a small portion of the city extended across the Luo River, Sui Luoyang spanned the river, utilizing the Gu River to excavate urban canals. These canals facilitated the city's water supply and transportation of goods between markets and granaries, reflecting an enhanced capability to manage rivers. Additionally, Emperor Yang of Sui constructed the Grand Canal with Luoyang as its center, allowing goods from the north and south to reach the Eastern Capital more conveniently.

After the fall of the Sui Dynasty, the Tang Dynasty continued to use Luoyang as its Eastern Capital. During the Wu Zhou period, Empress Wu Zetian favored

⁷ “Bu” is also an ancient Chinese unit of length, whose measurement varied across different periods. One *li* was equivalent to 240 to 360 *bu*, from which it can be inferred that the length of one *bu* ranged approximately from 1.15 to 1.34 meters.

Luoyang, and for a time, she managed state affairs from the Eastern Capital, making Luoyang the de facto political center of the country. During this period, the construction and development of Luoyang continued. For example, to accommodate the increasing number of ships traveling along the Grand Canal, in the first year of the Dazu reign (大足元年, 701 CE), a new port called Xintan (新潭) was built south of the Lide Ward in Luoyang to handle more cargo ships. According to the *New Book of Tang: Geography Section* (新唐书·地理志), “In Henan, there was the Luo Canal and Xintan; in the first year of Dazu, Xintan was opened to dock ships. (Ouyang, Song & Fan, n.d.)” This further demonstrates the flourishing development of Luoyang during that time.

After the Tang Dynasty, Sui-Tang Luoyang continued to serve as a capital or Secondary capital during the Five Dynasties and Ten Kingdoms period (五代十国). In the early Northern Song Dynasty, Luoyang was designated as the Western Capital.⁸ Although its political status was secondary to Kaifeng, its size surpassed that of Kaifeng, making it one of the largest cities in the country. However, this grandeur was short-lived, as Luoyang’s political significance waned with the shift of the nation’s economic and political center, and it gradually declined.

2.1.3 Foundation of the old city of Luoyang

2.1.3.1 The Jin Dynasty: Rebuilding the city by utilizing a corner of the Tang Palace

During the late Northern Song Dynasty, the outer wall of Luoyang gradually collapsed and fell into disrepair until it was almost entirely lost (Zhang, 2010). By the end of the Northern Song Dynasty, the Jingkang Incident (1127) forced the Song court to move south from Bianjing (Kaifeng). Prior to this (in November 1126), Luoyang had already fallen into the hands of the Jin forces. According to the *History of Song* (宋史),

“The Jin forces reached the other side of the river, and the Vice Commissioner of Xuanfu, Zhe Yanzhi, led an army of 120,000 to resist them. On Jiayu day (甲戌), the army was

⁸ Western Capital (in Chinese is Xijing), was one of the secondary capitals of the Northern Song Dynasty. Since Luoyang was located to the west of its primary capital, Kaifeng, it was referred to as Xijing (Western Capital). In addition to Luoyang, the Northern Song also established Northern Capital Daming (present-day Handan) and Southern Capital Shangqiu (present-day Shangqiu) as secondary capitals.

defeated, and the Jin forces crossed the river. The prefect of Heyang, Yan Ying, and the military governor of Xijing, Wang Xiang, abandoned the city and fled.” (Tuoketuo, n.d.)

Afterward, Luoyang became a battleground between the Song and Jin forces for nearly a century (approximately 1125–1217), and the repeated occupation by both sides resulted in the destruction of palaces and residences.

During the Jin Dynasty’s rule, the Jin forces rebuilt Luoyang on the ruins of the Sui-Tang Eastern Capital (Yan, Zhao & Liu, 2019). According to *Henan Prefecture Annals* of the Yuan dynasty,

“In the early period of the Jin Dynasty’s rule over Luoyang, the city continued to follow the administrative system of the Song Dynasty, serving as a secondary capital. In the early years of the Zhengda reign, Henan was designated as the central capital (中京), and Henan was renamed Jinchangfu (金昌府). A city was built, extending east to the Chan River, south to the southern outer wall of the old city (refer to the Sui-Tang Luoyang city), west to the western outer wall, and shrinking northwards by only 1 li from the previous boundaries. (Luoyang Difangzhi Bianzuan Weiyuanhui, 2011)”

In the early Zhengda period of the Jin Dynasty (1224), Luoyang was rebuilt as the central capital on top of the ruins of the Song Dynasty’s Luoyang (which also encompassed parts of the Sui-Tang Eastern Capital and its wards), resulting in a smaller-scale city.

Initially, the Jin Dynasty’s Luoyang city walls were made of earth, but in the Ming Dynasty, the walls were reinforced with brick, further defining Luoyang’s city boundaries as being “8 li and 345 bu in circumference”. In terms of spatial scale, this Jin-built city of Luoyang was much smaller than the Sui-Tang Eastern Capital, which had a circumference of “73li and 150bu. (Wei, 1974)” This marked a stark contrast in the city’s scale, reflecting the rapid decline of Luoyang’s status after the Song Dynasty.

Shortly after the Jin Dynasty rebuilt Luoyang, the Southern Song and the Mongols allied to overthrow the Jin Dynasty. In the second year of the Tianxing reign of Jin (1233), they captured Jin’s central capital. According to the agreement between the Song and Mongols, both forces withdrew after the fall of Jin. In the

first year of the Duanping reign (1234), Emperor Lizong of the Song Dynasty dispatched troops to reclaim Bianjing (Kaifeng), western capital (Luoyang), and southern capital (Shangqiu). However, this was short-lived, as conflict between the Song and the Mongols resumed in Henan shortly afterward, leading to the Mongol conquest of Luoyang. The failed “Duanping Campaign” became the catalyst for the Mongol’s southward invasion of the Southern Song, and Luoyang became the Mongol army’s frontline.

The long-standing conflicts between the Song, Jin, and Mongol forces over Luoyang not only led to the destruction of the grand city established during the Sui-Tang period but also left the Jin-era “Jinchangfu” caught in the turmoil of warfare, causing the city to gradually decline.

In 1279, the Mongols conquered the Southern Song, and the Yuan Dynasty was established. During the Yuan Dynasty, the Jin-era Jinchangfu was renamed “Henan Prefecture Circuit (河南府路)”⁹ and placed under the administration of the Henan-Jiangbei Province (河南江北行省). From this point on, Luoyang ceased to be a capital and became merely the administrative seat of Henan Prefecture Circuit. This marked a further decline in Luoyang’s status, reducing it to a regional city at the prefecture level. According to the *Henan Prefecture Annals* of the Yuan dynasty,

“The Luoyang city in Yuan followed the Jin system. However, half of the land within the imperial city had been plowed into fields, the inner city only contained fourteen wards, and the population was sparse—there was no longer the bustling brightness of the Sui-Tang era. (Zhang, 2010)”

2.1.3.2 Clarifying city boundaries in the Ming Dynasty

In April of the first year of the Hongwu reign (1368), the Ming army occupied Henan Prefecture Circuit. In May, a Henan branch of the Central Secretariat (中书省) was established in Kaifeng, and Henan Prefecture Circuit was renamed Henan Prefecture (河南府), with Luoyang as its administrative center (Liu, 2007). After the turmoil of the late Yuan and early Ming periods, the economy of many regions,

⁹ Circuit (路): a Yuan Dynasty administrative division equivalent to a regional circuit overseeing multiple counties and prefectures. It is equal to the prefecture (府) of Ming and Qing dynasties.

including Luoyang, was stagnant. Coupled with the corruption and inefficiency of the Yuan Dynasty, the Ming government restructured the administrative divisions in the early Ming period. In the second year of the Hongwu reign (1369), the former Song Zhou (嵩州) of the Yuan Nanyang Prefecture was downgraded to Song County (嵩县) and placed under the jurisdiction of Henan Prefecture. The restructuring of administrative divisions, combined with Luoyang's favorable geographical conditions, led to economic recovery (Liu, 2007). By the 24th year of the Hongwu reign (1391), Henan Prefecture, where Luoyang was located, had become an important grain-producing area in western Henan. As the economy gradually recovered, the city of Luoyang also underwent some repairs, with the most significant project being the construction of brick-clad city walls.

According to the *Luoyang County Annals*, the Jin Dynasty's city walls were initially made of earthen embankments. In the sixth year of the Hongwu reign (1373), "Commander Lu Ling rebuilt the walls with brick and stone to a height of four zhang (丈), with the base as wide as the height, and the circumference was 8 li and 345 bu." (Wei, n.d.) In addition to rebuilding the city walls, a moat five zhang deep and three zhang wide was also excavated.¹⁰ The construction of the city walls and moat not only enhanced the city's defensive capabilities but also further clarified the city's boundaries. Archaeological evidence indicates that the brick-clad walls and the city's boundaries from the Ming Dynasty were based on those from the Jin and Yuan periods and continued into the Republic of China era (Wang, Lü, Zhao, Pan & Zheng, 2015).

In terms of urban form, Ming Dynasty Luoyang largely retained the city's layout from the Jin-Yuan period. However, in the early Hongwu period, the city's northeastern corner became the site of the Prince of Yi's palace, located at the center of the city. This palace was the domain of Zhu Yi (朱欒), the 25th son of the Ming Emperor Zhu Yuanzhang. Zhu Yi was granted the title of Prince of Yi in the 24th year of the Hongwu reign (1391) and officially took up residence in Luoyang in the sixth year of the Yongle reign (1407). The central location of the palace represented the power of the imperial lineage, as it was considered proper for the royal family to reside at the city center, signifying its prestige.

¹⁰ Zhang is a traditional Chinese unit of length, used both in ancient and modern times. The length of one zhang is approximately equivalent to 3.3 meters in modern measurements.

The Zhu Yi passed through seven generations before the eighth Prince of Yi, Zhu Dianying (朱典模), became infamous for his misdeeds. According to the *History of Ming* (明史),

“Dianying was greedy and obstinate, frequently finding fault with officials. If they did not comply with his wishes, he would conspire to have them removed from office, and once they were gone, he would further humiliate them. When the walls of his palace fell into disrepair, he requested their reconstruction but instead seized private homes to expand his palace. The imperial guards remarked that the king treated him with great favor, though the reason remained unclear. One night, he held a grand celebration with music lasting until dawn. Within the palace, everyone chanted ‘long live’ (千岁), while Dianying falsely claimed, ‘The Emperor personally favors me.’ He ordered the gates of Henan Prefecture to be closed and selected over seven hundred daughters from the local population. Among them, ninety beautiful ones were kept, while those who were not selected were required to pay a ransom to redeem themselves. (Zhang, n.d.)”

Due to these actions, local officials and citizens suffered greatly, and eventually, Zhu Dianying was punished. The *History of Ming* records,

“Dianying was debauched and lawless, repeatedly pardoned by the emperor but never changed his ways. His treachery grew worse, and he was eventually imprisoned and stripped of his princely title. (Zhang, n.d.)”

During the Wanli reign, the Yi Prince’s palace was expanded to become the domain of Zhu Changxun (朱常洵), the third son of Emperor Wanli, who was granted the title of Prince of Fu and was given Luoyang as his fief. The grand scale of the Fu Prince’s palace was likely influenced by the fact that Emperor Wanli initially intended to make Zhu Changxun the crown prince but was thwarted by opposition from officials and the empress dowager. The construction of the Fu Prince’s palace took 14 years and was considered a significant project.

In addition to the princely palaces, the city of Luoyang during the Ming Dynasty was equipped with the necessary government offices and ceremonial

buildings for both the prefecture and county levels. These structures were documented in the *County Annals* of the Qianlong reign. (Figure 2-6)

By the end of the Ming Dynasty, due to frequent attacks by bandits, a perimeter wall was built around Luoyang, standing 1 zhang 3 chi high and 1 zhang wide. Additionally, a 33-li city wall was constructed, making Luoyang a well-fortified city. However, the rushed construction resulted in lower-quality buildings (Zhang, 2014, p.29).

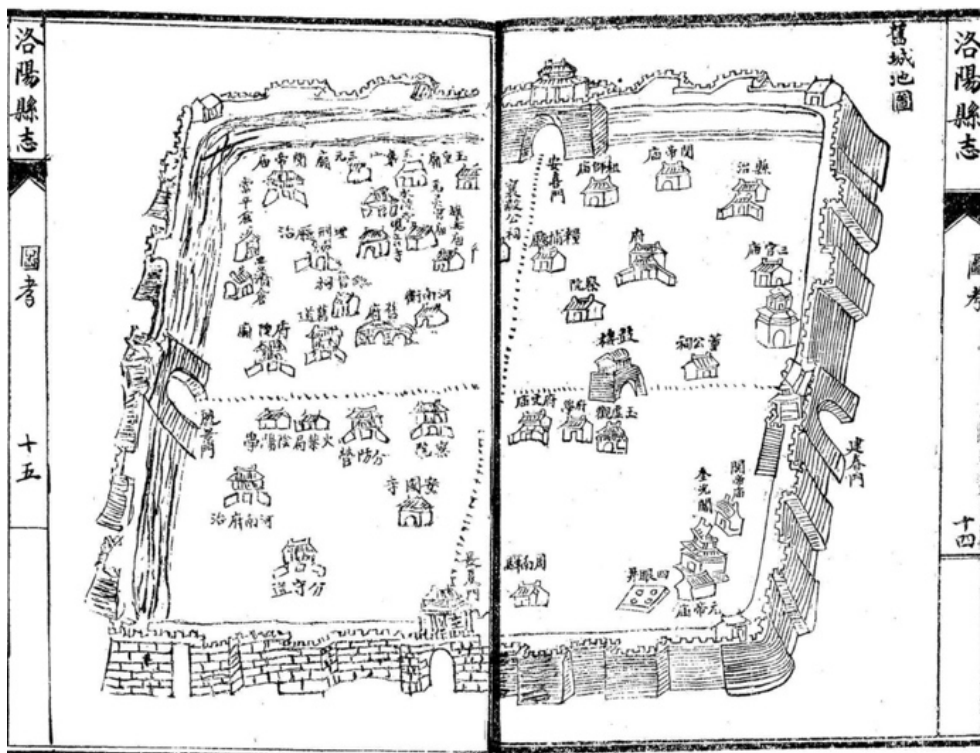


Fig. 2-6 A map of the old city in the Ming Dynasty contained in the *Luoyang Xianzhi* (Luoyang County Records) of the Qianlong period of the Qing Dynasty (Source: *Luoyang xianzhi*)

2.1.3.3 Reconstruction and repairs in the Qing Dynasty

As a regional city, Luoyang's urban structure remained relatively stable over time, though periods of war during dynastic transitions often led to destruction, followed by reconstruction that typically adhered to previous city layouts and building placements. In the early Qing period, Luoyang was in a state of disrepair, with both the Henan Prefectural office and the Luoyang County office being temporarily housed in civilian residences (Zhang, 2014, p.23). As stability returned, these government buildings were rebuilt, reflecting the continuity of Luoyang's stable urban structure and limited internal updates.

On the whole, aside from the relocation of government offices, Qing Dynasty Luoyang essentially followed the urban layout established in the Ming Dynasty. Only minor repairs were made to the city walls, streets, and major buildings, with no large-scale expansion of the city (Zhao, 2013, pp.57-63).

Repairing the city walls was an important construction project in the early Qing period. According to official records, large-scale wall construction projects were concentrated during the Kangxi and Qianlong reigns. Emperor Qianlong remarked, “Among all local projects, none is more significant than the construction of city walls. (Liu, 2012, p.20)” For Luoyang, most wall construction took place during the reigns of Kangxi, Yongzheng, and Qianlong.

According to the *Luoyang County Annals*,

“In the second year of the Shunzhi reign (1645), Inspector Zhao Wenwei began repairs, completing only the west wall. In the sixth year, Prefect Jin Ben led the project and used bricks and tiles from the abandoned palace of the Ming Prince of Fu to reinforce three sides of the wall. Eight towers were built at the four gates. In the 44th year of Kangxi, Prefect Zhao Yujing and County Magistrate Wu Zheng repaired the southern gate tower. In the 46th year, Acting Prefect Zhao Guangrong repaired the eastern gate tower. In the 61st year, Prefect Liu Tianjue and County Magistrate Zeng Ruwei repaired the western gate. In the sixth year of Yongzheng, Prefect Zhang Han and County Magistrate Wang Zhenyu repaired the southern gate. In the 27th year of Qianlong, Prefect Fuaerhuna and County Magistrate Wang Yu oversaw repairs. (Zhang,2014, p.28)”

These records suggest that most of the significant wall construction in Luoyang occurred in the mid-Qing period, with later projects becoming less frequent due to social unrest and natural disasters.

Although Luoyang’s political status declined continuously after the Song and Jin dynasties, and the city itself underwent a transformation from a national capital to an auxiliary capital and eventually to an ordinary city, its long history as a national capital left a legacy that gradually faded in its tangible spaces. Much of this legacy now exists in the vast corpus of historical writings and the imaginations of literati. Nevertheless, Luoyang’s geographical location and its advantages in transportation continued to enable it to serve as a regional political, economic, and

cultural center, maintaining considerable influence during the Ming and Qing dynasties. In addition to the Ming dynasty royal residence, many high-ranking officials and wealthy merchants also settled in the city, creating large estates within and around Luoyang. Moreover, the cultural vitality of the Luoyang region remained strong over time. Beyond official ceremonial sites such as the City God Temple and Confucian Temple, numerous Buddhist temples and Daoist monasteries were located in and around the city, contributing to its cultural richness.

2.2 Causes and characteristics of the urban form of the old city

2.2.1 Factors forming the urban form of the old city

2.2.1.1 City walls: The symbol of the city

City walls are a defining feature of ancient Chinese cities. Chinese-American geographer Sen-dou Chang pointed out that in ancient Chinese, the word for city and city wall was the same word *cheng* (城). In ancient Chinese thought, a settlement without city walls could hardly be considered a city. Therefore, “*cheng*” or “city wall” is regarded as one of the key characteristics of Chinese cities (Chang, 1995, pp.75-76). The concept of the city being synonymous with its walls meant that the shape of the walls defined the city’s form; thus, the city’s general layout was already outlined during the construction of its walls. While the shape of city walls could vary depending on the natural environment, the “square” form was still the most common shape for ancient cities (Liu, 2012, p.20). On the one hand, city sites were often located on flat, open land, with only a few cities taking irregular shapes due to the surrounding terrain. On the other hand, the Chinese people revered the square form, a concept not only reflected in urban planning but also in the spatial organization of building complexes. As a result, the square-shaped city defined by its walls became the typical form of ancient Chinese cities, especially in northern China.

The most prominent function of city walls was to protect the space they enclosed, providing defense. Therefore, city walls were often given priority and maintained during times of unrest. However, throughout Chinese history, even during relatively stable periods, large-scale city wall construction occurred. This points to another important role of city walls: symbolizing state power (Lu & Ma, 2009).

In his research on urban space and power, Chinese historian Lu Xiqi noted that

“In the political consciousness of the imperial era, city walls primarily symbolized the authority of the state and government, serving as a representation of power. The majestic city towers, high walls, and wide moats formed a picture symbolizing the dynasty’s might and strength. (Lu & Ma, 2009, pp.83-84)”

City walls were often the highest structures in a city (Liu, 2012, p.13), and they were also the most prominent (Wang, 2019). City walls helped establish the authority of the government, unify public sentiment, and ultimately maintain social order—a purpose that, in many cases, surpassed the defensive function of the walls.

Regarding the origin of city walls in China, the development of city walls can be traced back to the matrilineal society period when the first village with a moat appeared. The earliest city walls were essentially earth piled beside the moats. “Chenghuang” (城隍, city and moat) is mentioned in the *Book of Changes*, referring to the connection between city walls and moats (Chang, 1995). According to the *Shuowen Jiezi* (说文解字, *Explaining and Analyzing Characters*), “cheng” means “to contain the people,” and “huang” refers to the moat. The close relationship between city walls and moats makes “chenghuang” a closely linked concept. In ancient China, a city could not exist without walls and a moat to protect its people. Thus, “chenghuang” came to represent both city walls and moats, and a settlement could only be called a city once it had these features.

As a symbol of a city, the length and height of city walls had to meet certain standards. The *Kaogongji* (考工记, *Book of Diverse Crafts*) in the *Zhouli* (周礼, *Rites of Zhou*) stated, “The craftsmen plan a city 9 li in length, with 3 gates on each side,” outlining a square-shaped city as the ideal royal capital. The scale of the city and its walls were crucial factors in determining the city’s size. Cities were also ranked in a hierarchy, with each rank corresponding to different wall heights.

“The roof ridges of the royal palace must be 5 zhi (an ancient unit of measure), the corners of the palace walls 7 zhi, and the corners of the city walls 9 zhi... The structure of the palace gates establishes the standard of height for feudal lords’ capital city, and the corner structure establishes the standard of height regional lords’ capitals.”

According to these standards, lower-ranked cities, such as those of regional lords, were not permitted to have walls higher than the royal palace.

Similarly, the size of cities varied according to their rank, which determined the circumference of the city walls. In the *Zuo Zhuan* (左传, *Chronicles of Zuo*), it is mentioned that Jizhong Dafu considered oversized capital cities a national threat: “If a capital’s walls exceed a hundred zhi in length, it becomes a threat to the state. A large city should not exceed one-third the size of the capital, a medium city one-fifth, and a small city one-ninth. (Zuo & Du, 2023)” In this way, the king’s capital, as the seat of the highest power, had the largest urban area.

Although the feudal system (分封制) gradually disappeared over time and the *Zhouli*’s rules for city walls no longer applied, the relationship between a city’s rank and the length and height of its walls persisted. As the emperor’s capital, the city had not only the largest urban area but also developed a spatial structure with multiple layers of walls, including the imperial city, the royal city, and the outer city. Other cities followed a hierarchical system of urban scale according to their administrative level.

In cities below the rank of capital, most were enclosed by a single city wall, with only provincial capitals or strategically important frontier cities having dual walls (Chang, 1995, p.79). In these cities, the walls divided the city into an inner city and an outer city. According to the *Guanzi*, “Within the city is the inner city, and outside the city is the “guo” (郭, suburb).”¹¹ The inner city housed official buildings, ceremonial structures, and residences of the ruling class. Common people typically lived outside the city walls, and over time, suburbs formed around many cities, becoming commercial and residential districts. (Chang, 1995, p.99)

2.2.1.2 Orientation: Symbol of power and authority

The primary function of ancient Chinese cities was governance, encompassing not only political and military control but also economic and cultural dominance (Lu & Ma, 2009, p.81). According to scholar Chang Kwang-chih, early Chinese cities were not the result of a division between agriculture and craftsmanship, nor were they products of commercial trade development. Instead, they emerged as tools and symbols of political power (Zhang, 1985, pp.61-67). This focus on

¹¹ Guo: refers to the urban area located outside the city walls but directly adjacent to them.

governance shaped a set of symbolic systems within and outside cities, making them integral elements of ancient urban morphology alongside city walls.

As noted by American historian and sinologist Arthur F. Wright, ancient Chinese cities were viewed as the cosmic center where heaven and earth converged, where the four seasons and the forces of yin and yang intersected. Below the capital, cities at every level acted as centers of control over their respective regions (Wright, 1995). This created a network of power across the country, through which the imperial rule was extended over the vast territories of the state.

Correspondingly, the primary spaces within cities were naturally occupied by administrative and ceremonial buildings, as well as those associated with governing elites. The administrative spaces represented imperial power and included governmental offices and military institutions, while ceremonial buildings represented cultural authority, such as city god temples, Confucian temples, and major Buddhist and Daoist temples.

Over time, ancient Chinese cities developed a systematic symbolism that became a convention. In this system, the placement of important buildings followed relatively clear rules. The *Kaogongji* in the *Zhouli* reflects this symbolism: “The ancestral temple is to the left, the altar of earth and grain is to the right, the court is at the front, and the market is at the back. (左祖右社,前朝后市)” Although few cities in later periods strictly adhered to the layout described in the *Kaogongji*, the text demonstrates the influence of ritual norms on the arrangement of important buildings, which in turn influenced urban form.

The symbolic significance of building orientation becomes even clearer when considering the location of typical building types within a city. For example, the administrative headquarters, representing the highest authority, was often located at the center of the city, symbolizing its supreme administrative power within the region. In the cultural realm, city god temples were often located near the city walls because the “city god” originated from the concept of the city walls and moat (*chenghuang*). Over time, the city god became a deity overseeing the underworld’s administrative and judicial affairs. Local officials participated in city god worship ceremonies annually, and this official involvement imbued the city god, once a folk belief, with a semi-official status. This reflected the imperial authority (represented by local officials) acknowledging and accommodating the beliefs of the people (represented by the city god overseeing the world of dead) (Feuchtwang, 1995, p.589). Similarly, the Wenfeng Pagoda, associated with literary success, was often

placed in the southeast (Xun position, 巽位) of the city, as this was the location of the star associated with scholarly achievement.

In addition, the four cardinal directions within a city followed a specific order of precedence: south, north, east, and west, in descending order of importance. Chinese cities of all sizes were generally laid out with north-south as the primary axis and east-west as the secondary (Liu, 2012). Sen-dou Chang further pointed out that these directions corresponded to the four seasons, each with its own symbolic meaning. The south, associated with warmth and life, was often the site of festive activities near the city's southern gate, while the north, associated with cold and death, was linked to military functions (Chang, 1995, pp.96-97). This further demonstrates the symbolic importance of spatial orientation in ancient Chinese cities.

2.2.1.3 Stable urban spatial structure

Stability is a characteristic of Chinese cities, which can be explained in two ways. On the one hand, as an agrarian state for much of its history, China's primary focus was on rural areas, which were the key to territorial expansion and governance. According to Wright, "For over three thousand years, when expanding into new territories, the Chinese did not view cities as the basic units of control, whether practically or symbolically. Instead, the important step was to expand Chinese agriculture from a rural center. Once the region was settled and the population stable, villages would be established as administrative centers for the empire. (Wright, 1995, p.33)" This was different from ancient Rome, where "as soon as the Romans gained a foothold in newly conquered territory, they would begin building a new city (urbs) (Wright, 1995, p.33)."

Additionally, China's long-standing traditional of emphasizing agriculture and suppressing commerce (重农抑商) suppressed factors that could have promoted urban development. Until recent times, the growth of industry and commerce, which are often drivers of urban expansion, was limited in Chinese cities.

On the other hand, the Chinese perception of cities also played a role. In Western societies, cities were often celebrated as cradles of civilization, while the countryside was seen as uncultivated and barbaric. Westerners sought to make cities eternal and imbued them with a sense of monumentality. In contrast, Chinese cities and the countryside were not seen as opposing forces of civilization and barbarism. Scholars and elites enjoyed both city life and rural settings. In Confucian thought,

rural life was considered virtuous, while the city was seen as a place of vice and corruption (Wright, 1995).

Therefore, Chinese cities, as political and economic centers, and the countryside as the home of the masses, could be viewed as a continuous whole, in which the countryside supported the city's role as a governing center. This balance, suited to pre-modern societies, meant that cities did not experience unchecked population growth and expansion.

Accordingly, urban construction in ancient China did not strive for permanence, which is reflected in the choice of building materials. The use of wood, which was not durable, made periodic rebuilding and renewal the norm. Thus, cities did not grow endlessly; instead, most changes occurred within the city itself, either through spontaneous or forced renewal.

In summary, city walls, symbolic orientations, and the placement of buildings together formed the foundational elements of ancient Chinese urban morphology. These features demonstrate the common characteristics of Chinese cities, serving as symbols of imperial power and the spatial embodiment of authority. Long-standing traditional of emphasizing agriculture and suppressing commerce slowed urban development, allowing cities to maintain relatively stable forms throughout China's long history of change.

With this understanding of the characteristics of ancient Chinese cities, we can now examine the traditional urban morphology of Luoyang's old city during the late Qing Dynasty.

2.2.2 Characteristics of the old city's urban form

The overview of the characteristics of ancient Chinese cities above reveals certain commonalities, but cities also exhibit differences due to factors like topography and historical patterns, which directly influence their forms. Therefore, when discussing the urban form of Luoyang's old city, attention should not only be given to these commonalities but also to Luoyang's unique geographical environment and the long history of capital construction.

After the Jin Dynasty, Luoyang was no longer a capital city, meaning the city no longer underwent large-scale reconstruction to showcase shifts in imperial power with each dynasty change. This situation was also reflected in the city itself; the frequent relocations of capital sites seen during the period of "Five Capitals

Converging in Luoyang” no longer occurred. As a typical regional city, Luoyang’s urban layout remained largely unchanged, aligning with the long-term stability characteristic of Chinese cities.

Through the maps recorded in the *Luoyang County Annals* of the Kangxi, Qianlong, and Jiaqing reigns (Figure 2-7), the continuation of this stable urban layout is clear. Although ancient Chinese maps were drawn using methods different from those of the West—focusing on depicting the city’s general shape and surrounding topography, as well as labeling ceremonial buildings rather than aiming for scale accuracy or complete expression of the street network (Whitehand & Gu, 2007, p.92) —these maps still allow us to understand the city’s internal spatial organization and important building types.

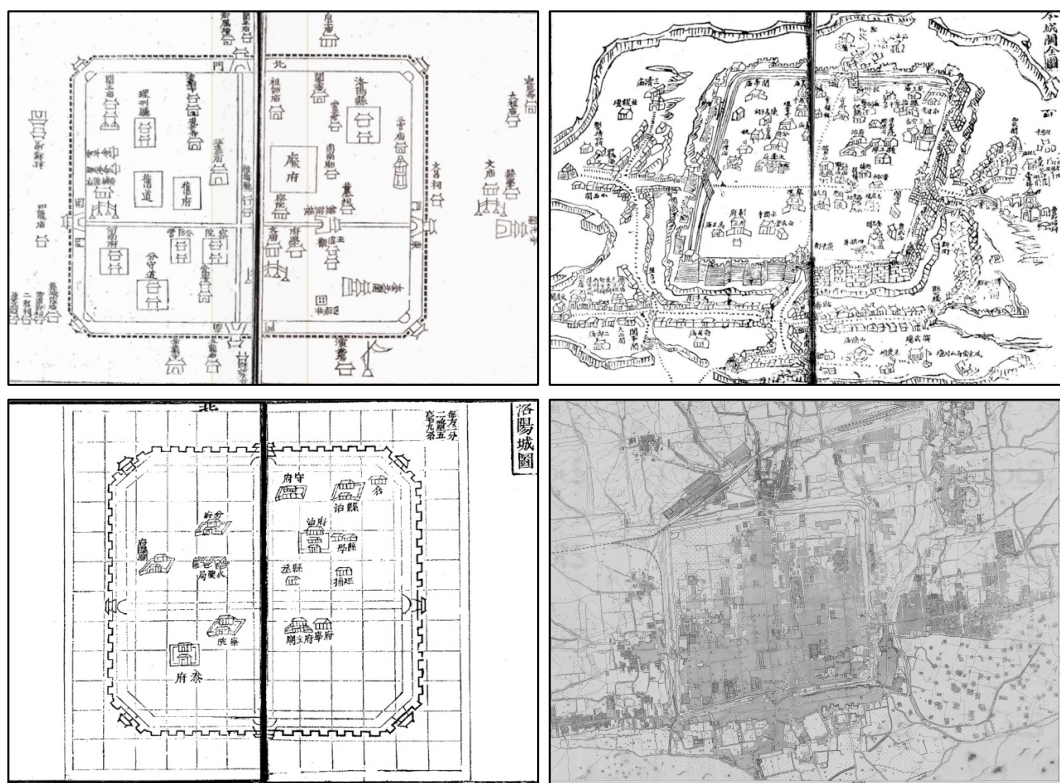


Fig. 2-7 The map of Luoyang in Kangxi, Qianlong, Jiaqing period of the Qing Dynasty and the map of inner city and four of gate-areas in the early period of the Republic of China (Source: db.lydswz.cn)

In discussing the urban morphology of late Qing Luoyang, we can also refer to the *Map of Luoyang City and its Four Gate-areas*, surveyed and drawn by the Beijing government in the fourth year of the Republic of China (1915). This map, which adheres to modern cartographic standards, presents a detailed and accurate depiction of the distribution of blocks, streets, and alleys within Luoyang, marking key administrative offices, ancestral temples, and shrines, thus laying the

foundation for a detailed analysis of the city's urban form during the late Qing period.

2.2.2.1 City walls defining the urban boundary

The city walls of Qing-era Luoyang enclosed the city in a near-rectangular shape, reflecting the traditional preference for cities with a square or rectangular layout. In *The Role of Orientation and Ritual in Chinese Traditional Architecture and Environment*, scholar Zheng Xiaoxie explains the unique characteristic of traditional Chinese architecture and cities, where both large and small structures embody “the uniformity and yet endless variation of the square shape.(Zheng, 1993)” Thus, even after losing its status as a capital, Luoyang, as a northern city, continued to adhere to the principles of ritual and tradition in its urban form.

The city walls of Qing Luoyang extended for 8 li and 345 bu (approximately 4.5 kilometers), with a height and width of 4 zhang (about 13.3 meters), and featured four gates and four towers. In terms of scale, Luoyang (which was the seat of the Henan Prefecture and could also be referred to as “Henan Prefecture”) ranked in the middle of Henan Province's cities, smaller than the provincial capital, Kaifeng. This reflects the differences in scale between administrative cities based on their rank. Among prefectural cities, Luoyang's size was comparable to other cities and was among the largest. The number of gates, with one in each direction, was also appropriate for a prefectural city. However, Luoyang's city walls were the tallest and widest, even surpassing those of Kaifeng, the provincial capital, reflecting Luoyang's significance and the solid foundation of its urban construction.

During times of frequent warfare or in areas with banditry, city walls ensured the city's security. However, located in the Central Plains and surrounded by mountains, Luoyang was mostly in a peaceful and stable environment, except during dynastic changes. In this context, the walls primarily served as symbols of imperial authority.

In peaceful times, there was little difference between the living environments inside and outside the walls, and the area outside the city walls gradually developed into a bustling commercial district. However, this did not mean the city walls completely lost their functional role. The city gates, which opened and closed at fixed times, played an important role in regulating the flow between the inner city and the outside. As key nodes connecting the city's interior and exterior, the gates were opened each morning and closed in the evening, embodying the inward-looking and closed nature of ancient Chinese cities. The non-continuous flow

between inside and outside the city influenced both the urban economy and the behavior of citizens.

From the aerial photographs of the Luoyang old city taken by German pilot Wulf-Diether Graf zu Castell-Rüdenhausen in the 1930s, it is clear that the city wall defined the boundaries of the city and determined its overall shape. As the dividing line between the inside and outside, development within the city stopped at the walls, while development outside began at the city gates, creating a clear distinction between the two. The walls were also significantly taller than other buildings in the city, making them a prominent urban landmark (Figure 2-8).



Fig. 2-8 The aerial photography of Luoyang in 1930s (Source: https://m.thepaper.cn/newsDetail_forward_1528201?bdchannel=)

2.2.2.2 The inner city preserving historical patterns

The old city of Luoyang preserved its historical layout mainly through the four intersecting streets and the placement of key governmental buildings. The streets continued the spatial patterns of Sui-Tang Luoyang, while the positions of government offices remained relatively stable throughout the Jin, Yuan, Ming, and Qing dynasties.

Regarding the streets, cities with four gates in ancient China often had five ways of arranging their intersections (Figure 2-9). However, cities generally avoided direct roads between gates. This was partly due to defense considerations, as

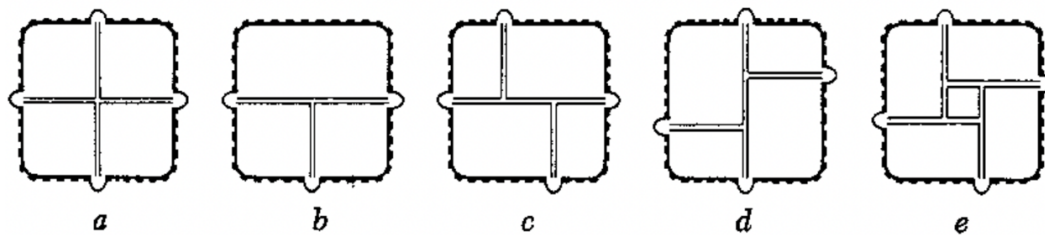


Fig. 2-9 The layout of the main roads within the ancient Chinese cities

invaders usually came from the north, and also because the north was considered the direction from which evil spirits came. Superstitions held that ghosts traveled in straight lines, so offsetting roads by a certain distance would block their path. Thus, cities often shifted roads leading to the northern gate or eliminated the northern gate entirely, leaving only gates to the east, south, and west (Chang, 1995, pp.97-98).

The roads in Luoyang did not avoid these unfavorable factors, likely because the two main streets were continuations of an older city layout. The Jin Dynasty built its new Luoyang on the site of the old Sui-Tang palace, and the new city's main roads continued the layout of the palace and residential areas of Sui-Tang Luoyang. Recent archaeological work has further clarified the overlapping relationships between the roads of Jin-Yuan-Ming-Qing Luoyang and Sui-Tang Luoyang: the old city's main north-south streets, Nandajie and Beidajie, align with Sui-Tang Luoyang's Huianmen Street, while the main east-west streets, Dongdajie and Xidajie, align with Shangdongmen Street and Xuanrenmen Street (Zeng, 2023). This explains why Luoyang, unlike most other cities, has direct north-south and east-west roads and why the intersection of these roads is not in the city center but slightly to the south (Figure 2-10).

These four roads divide the old city into four unequal parts, primarily residential areas with courtyard houses, interspersed with government offices and ceremonial buildings. The influence of the traditional preference for the South(以南为尊) meant that the city's overall layout exhibited a "southern orientation." Moreover, when selecting sites for homes, residents tended to avoid the northern parts of the city, where undesirable places such as ponds, prisons, and execution grounds were located, both geographically and in terms of feng shui (风水). This resulted in higher building and population density in the southeast and southwest

parts of the city compared to the northeast and northwest. The number of “li”¹² (residential units) also reflects this pattern. According to the *Luoyang County Annals* from the Qianlong reign, the southeast had three li, each containing ten jia (households); the southwest had two li; the northeast had three li; and the northwest had three li (Gong & Wang, n.d.). Although the southeast and northeast both had three li, the southeast had a higher density due to its smaller size. The southwest only had two li because the area contained ponds that were unsuitable for construction.



Fig. 2-10 The relationship between main roads in Qing Dynasty and the roads network in Sui and Tang Dynasties in Luoyang City

Government offices and ceremonial buildings were also located in places reflecting historical patterns (Figure 2-11). The highest-ranking building in late Qing Luoyang was the Henan Prefecture Office, which did not occupy the same site as the Jin-Yuan-Ming prefectural office but was located in the center of the city, where the Ming Dynasty prince palace had been, thus maintaining this important

¹² Here, the term “li” is different from the “li” mentioned earlier. In the previous context, “li” appeared as a unit of length, whereas here, it refers to an administrative unit within a city.

position and reflecting the office's role as the regional center of power.¹³ The county office, as a lower-ranking institution, was located in the north, emphasizing its lower status, and the Qing Luoyang County Office also continued the location of the Ming county office. According to the *Luoyang County Annals* from the Jiaqing reign,

“In the 42nd year of Wanli, the prince's palace was built, moving to the northeast corner of the city near Ying'en Lane... In the first year of the Qing dynasty, County Magistrate Wu Panlong

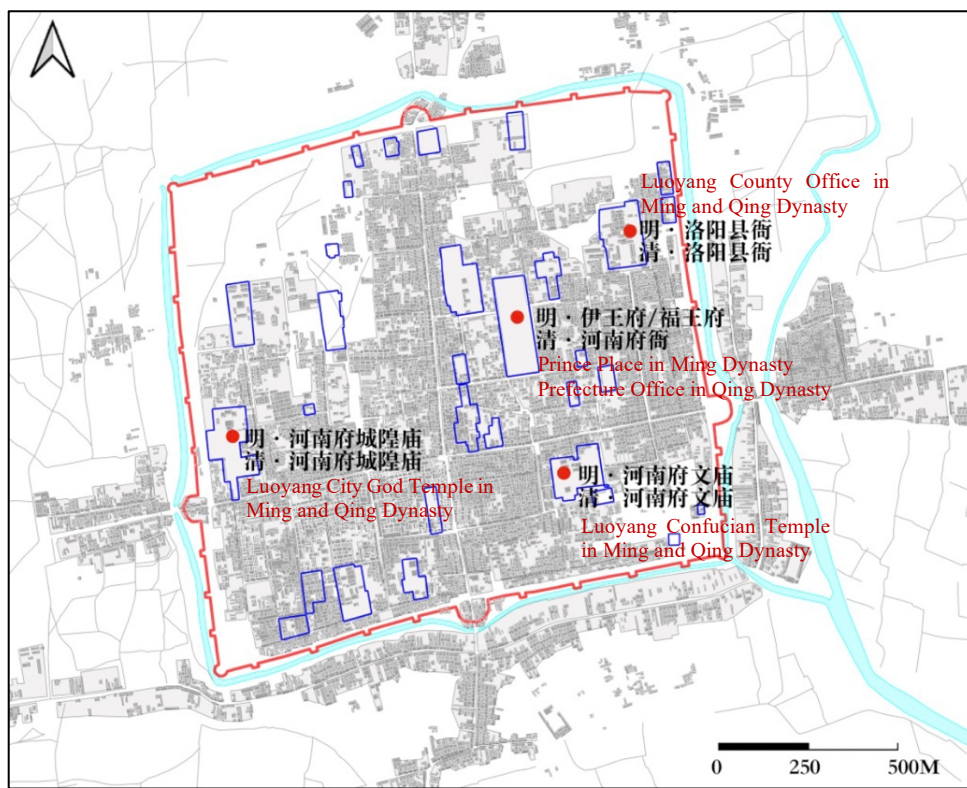


Fig. 2-11 The architecture following the historical site in Qing Luoyang City

¹³ From the 18th year of the Shunzhi reign (1661) to the 3rd year of the Kangxi reign (1664) during the Qing Dynasty, the Henan Commander-in-Chief's Office (河南提督衙门) was established in Luoyang, serving as the highest provincial military authority at the time. The Henan Commander-in-Chief renovated the Ming Dynasty princely residence to use as an office. Later, when the Commander-in-Chief's Office moved to the provincial capital of Kaifeng, the Henan Prefectural Office, as the highest local administrative authority, relocated to the site of the Ming princely residence. This demonstrates that the Ming Dynasty princely residence, as a center of power within Luoyang, continued its function in the Qing Dynasty, successively becoming the seat of the highest-ranking official offices.

rebuilt it on its old site, and subsequent magistrates continued to repair it following the old plan. (Wei, n.d.)”

In addition to government offices, important ceremonial buildings such as the Henan Prefecture City God Temple and Henan Prefecture Confucian Temple also reflected the continuation of historical spaces, showing the persistence of history in the urban form. For example, the Henan Prefecture Confucian Temple in the Qing dynasty was rebuilt multiple times on the foundations of the Ming dynasty temple. The *Luoyang County Annals* record that the temple was located south of the Luo River during the Jin dynasty, rebuilt north of the river in the Yuan dynasty, and repaired multiple times in the Ming and Qing dynasties (Sun, n.d.).

2.2.2.3 The uneven development of the city gates areas

The city wall separated the inner city from the outside, and the regular opening and closing of the city gates further restricted the free flow between the two. In this situation, life outside the city was freer both spatially and temporally, which was important for merchants. As mentioned earlier, the inner city mainly housed officials and elite residents, with administrative, educational, and residential buildings for the gentry, while ordinary citizens and merchants, whether restricted by social class or seeking convenience, primarily lived outside the walls (Lu & Ma, 2009, pp.85). Thus, in times of peace and economic growth, the areas outside the city gates often became vibrant commercial districts. In Luoyang’s old city, this prosperity was further influenced by geographical factors, leading to uneven development among the city gates (Figure 2-12).

To the south of the old city lies the Luo River, which served as a crucial link between the city and the Grand Canal during the Sui-Tang period. During this time, the Luo River was a bustling hub for trade, with goods arriving via the canal from the south and the north. After the Song dynasty, the navigability of the canal declined, and the political center shifted, causing Luoyang to decline as well. However, the Luo River was still navigable during certain seasons, and the city’s strategic location on land routes—eastward to Kaifeng and westward to Shanxi and Shaanxi—kept it connected. The main east-west road leading to the city passed through Jianchun Gate in the east, then turned south, closely following the city wall, before heading west toward Shaanxi. The area around Changxia Gate, near the Luo River, also had a dock where goods could be transferred between land and water routes.

This advantageous transportation network allowed Luoyang to continue functioning as a regional commercial center even after its decline. Historical records note that

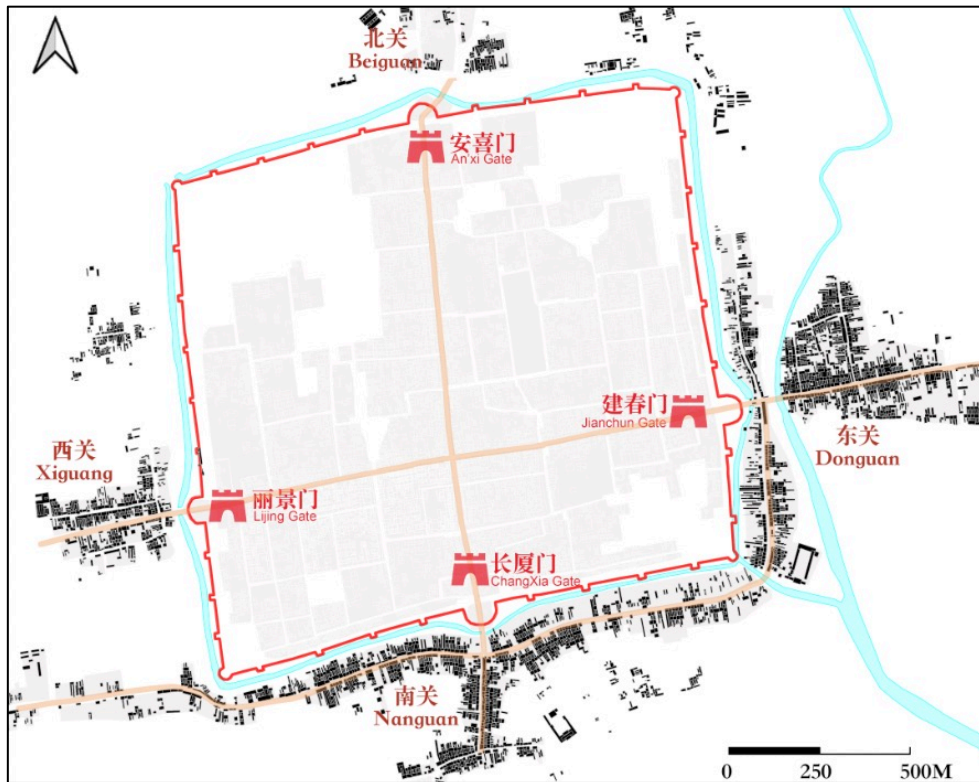


Fig. 2-12 Illustration of the layout of city gates and the morphology of the areas outside the gates

“Since the Three Dynasties and Han-Jin periods, it has been the capital of the empire, attracting officials and merchants. Although the Henan provincial government is located in Kaifeng, Luoyang remains a major hub for carriages and horses, serving as one of Henan’s largest commercial centers.”

This thriving commercial atmosphere helped the areas near Nanguan and Dongguan flourish, benefiting from the convenient transportation and relatively flat terrain.

In the Kangxi and Qianlong reigns of the Qing dynasty, merchants from Shanxi and Shaanxi built the Shanxi-Shaanxi Guildhall (山陕会馆) and Luze Guildhall (潞泽会馆) in Nanguan and Dongguan, respectively, as commercial hubs for merchants from these regions. Inscriptions found in these guildhalls show that between the Ming and Qing dynasties and the Republic of China, Shanxi-Shaanxi

merchants operated over 500 shops in the Nanguan area. Additionally, Dongguan became a major residential area for Muslim merchants engaged in trade by the late Qing period, contributing to its substantial population.

In contrast, Xiguan and Beiguan developed less, which can be attributed to land ownership and topography. Beiguan is near Mang Mountain, where the terrain is steep, making it unsuitable for urban development or agriculture. This limited its growth. Xiguan, while flat, was largely military land under rental by the local military command (Zhang, 2014, p.50), and being farther from the Luo River than Nanguan, it saw less residential and commercial development. According to the *Luoyang County Annals* from the Qianlong reign, Dongguan had four li, Xiguan had one li, and Nanguan had two li, while Beiguan was not recorded (Gong & Wang, n.d.), reflecting the differences in development across the four city gates.

Unlike the interior of the city, where development was constrained by historical patterns and the city walls, the areas outside the four city gates were freer to grow. Buildings were concentrated along the main roads that passed by the city walls and extended from the city gates. The uneven development of these areas was clearly

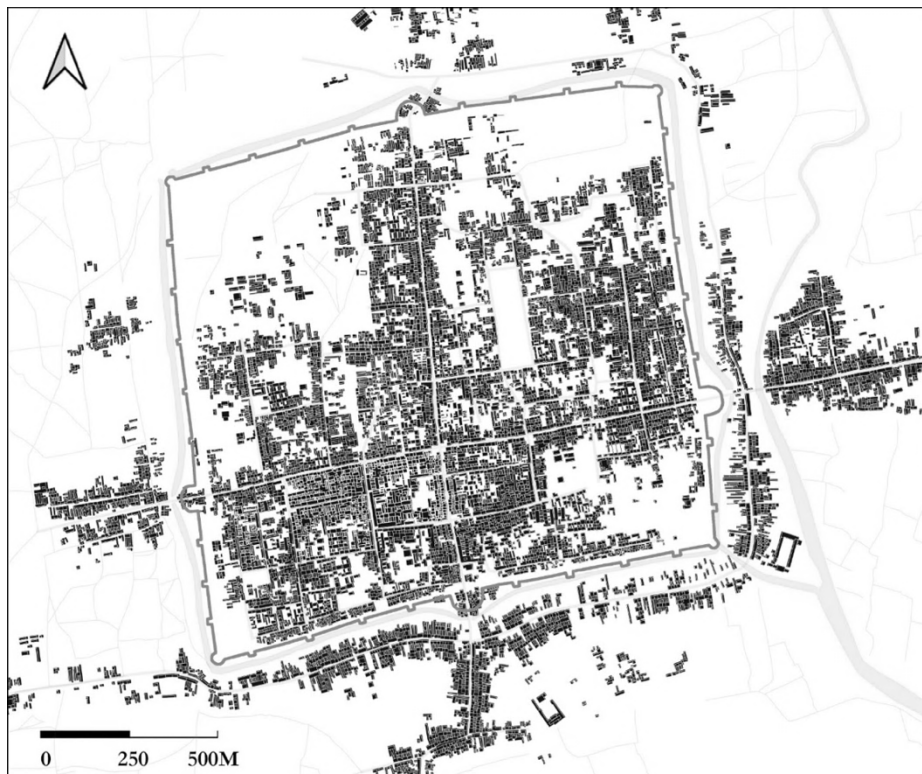


Fig. 2-13 Illustration of urban morphology of Luoyang, which shows the spatial characteristics of dense south and sparse north.

visible in the urban form, with the more prosperous Nanguan and Dongguan featuring a secondary network of streets and higher population density, while Xiguan and Beiguan remained smaller and less developed.

In summary, under the influence of traditional concepts, historical patterns, and geography, different parts of the old city exhibited varying spatial structures, collectively forming the overall urban morphology of Luoyang's old city, characterized by "one city, four gates, denser in the south, sparser in the north (一城四关, 南密北疏)" (Figure 2-13).

2.3 Analysis of the elements of the urban form of the old city

2.3.1 Courtyard houses as the foundation of the urban form

In ancient Chinese cities, courtyard-style housing was the fundamental form of urban dwelling. As Liu Dunzhen noted in *A History of Ancient Chinese Architecture* (*Zhongguo Gudai Jianzhushi*):

“Northern residential architecture is represented by Beijing’s siheyuan (courtyard house). This layout, governed by Confucian familial hierarchy, arranges rooms and courtyards symmetrically along a north-south axis.”

Zhuang Yuguang also elaborated in *The Seasons of Ancient Architecture* (*Gujian Chunqiu*), stating,

“Since the emergence of the siheyuan, its enclosed yet open space has aligned with the traditional patriarchal system, and as a result, it gradually spread across the country... The courtyard-style residence has become the basic residential model in many regions.”

Like most traditional cities in northern China, courtyard-style housing was also the primary residential form in Qing Dynasty Luoyang, serving as a dominant factor in shaping the city’s urban form.

These courtyard-style houses corresponded to large family units. The family was the basic cell of society. In China’s feudal society, familial ethics, grounded in a patriarchal system that emphasized family ties, served as the foundation for the

establishment of rituals and norms (Zheng, 1993, p.196). This fostered a relationship between the individual, the family, and the state. This close connection between “family” and “state” was not only reflected in intangible concepts and social customs but also in tangible material forms, as seen in the correlation between architectural forms and urban morphology. Like the overall urban structure, the courtyard-style houses reflected a pursuit of the ideal form of “square.” Moreover, just as the city’s “walls” defined its space, the courtyard walls of these houses created a similarly enclosed, inward-focused space. Thus, the relationship between the macrocosm of the city and the microcosm of the home was reinforced through these physical entities (Zhang, 1995). From this perspective, courtyard-style housing not only constituted an essential part of urban form but also extended the spatial cosmology of ancient Chinese cities.

2.3.1.1 Layout characteristics

As a typical form of traditional housing, the courtyard-style residences in Luoyang Old City followed general principles in terms of layout and ritual observance, while also reflecting strong regional characteristics.

In terms of commonalities, the layout of Luoyang’s courtyard houses emphasized proper north-south and east-west orientation, with a south-facing alignment considered the most prestigious. The overall layout was symmetrical and orderly, following the principle of “connected hallways and gates aligned on an axis (穿堂门, 一线开),” which created a spatial organization that was axial, with clear hierarchical divisions. This arrangement upheld Confucian values, where seniority and status dictated spatial hierarchy.

Functionally, along the central axis were the “reception room” (倒座, often used as guest quarters), the “main hall” (厅堂, where the homeowner greeted guests), and the “principal room” (正房, where ancestral tablets were enshrined). Along the sides of the central axis were the “wing rooms” (厢房, locally known in Luoyang as “sha rooms 厦房,” used as kitchens, storage, or living spaces for younger family members). This spatial arrangement formed a “front hall, rear sleeping area (前堂后寝)” pattern, where spaces near the street—usually the entrance to the residence—were reserved for more public activities, such as receiving guests, while more private family activities took place in the rear. In houses with multiple courtyards, the further back a room was, the higher its status.

Additionally, ritual practices were reflected in the structural regulations of these houses. Since Luoyang had been a fiefdom for princes during the Ming Dynasty, there were stricter regulations regarding the size of residential buildings. Although these restrictions were relaxed somewhat during the later Qing Dynasty, civilian houses were still typically confined to a structure of “sanjian wujia (三间五架, three bays and five purlins),” with only wealthy families permitted to construct houses with five bays.

One unique feature of courtyard-style residences in Luoyang Old City was the preference for long courtyards, (Ge, 2021, p.299) with the foundations of these houses typically built slightly higher than the surrounding streets (Ding, 2007, p.120). This gave rise to a distinctive “narrow frontage, long depth” form. While courtyard houses in Beijing had a frontage-to-depth ratio of about 1:1, and those in the Shanxi-Shaanxi region had ratios closer to 1:2, the ratio in Luoyang often reached 1:4. This elongated courtyard form resulted inside rooms that had wide frontage but shallow depth. Though the narrowness of the courtyards increased flexibility in constructing side rooms, allowing them to deviate from the standard “sanjian wujia” structure of the main rooms (with some larger courtyards having side rooms as wide as seven bays), the shallow depth of these courtyards constrained the depth of the side rooms. Consequently, to maximize the area of these side rooms, many residences in Luoyang used single-pitch roof, with the rear wall shared between neighboring courtyards. This elongated courtyard design also led to some variations, such as constructing side rooms on only one side of the courtyard or linking side rooms across two courtyards, with low walls or passageways separating them. These variations further enriched the characteristics of Luoyang’s courtyard-style houses.

Based on the above, it is possible to categorize Qing Dynasty Luoyang’s courtyard-style houses into several types. The basic type was a single, elongated courtyard, which could be expanded by adding more courtyards depending on the size of the plot and the family’s wealth. Side rooms could also be adjusted in number, or passageways could be simplified, resulting in either three-sided courtyards or continuous internal courtyards. In Luoyang Old City, these courtyard houses typically had three or four courtyards in series, with each residence occupying a width of about 10 meters and a depth of up to 80 meters (Figure 2-14). These residences generally housed extended families, and building a house of this size required significant financial resources on the part of the owners.

Some of the more prominent families had even larger homes, exceeding the standard “sanjian wujia” restriction. The homes of Luoyang’s “Four Great Families” from the late Qing period, for instance, often have more than one axis, and there are three or more courtyards on an axis. The Zhuang Family Mansion, built in 1831, had over 150 rooms and comprised three axes of courtyards, each with two main halls, side passageways, and back rooms, with side rooms on two levels.

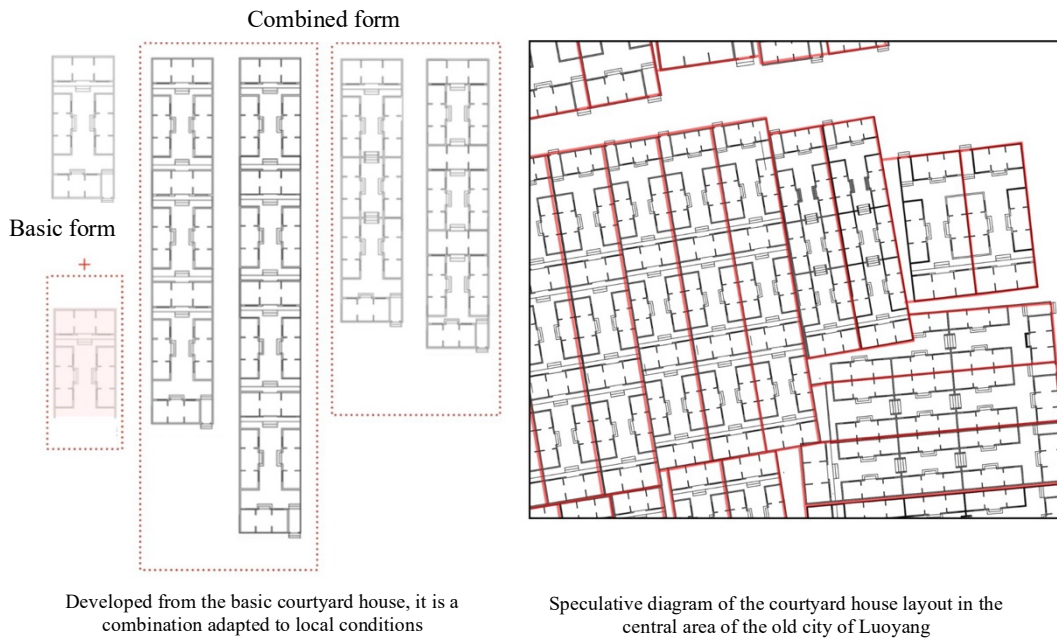


Fig. 2-14 The type of courtyard housing in the Qing Luoyang city

2.3.1.2 Grouping of courtyard houses

Similar to the layout of the city itself, each house was a small, self-contained “world” that followed traditional rituals principles, with south-facing orientations considered the most prestigious. In *Explanation of the Ritual Classics*, Ling Tingkan explained, “Facing east within a room is considered prestigious, and facing south in a hall is considered even more so.” Zheng Xiaoxie further elaborated, noting that the hall was the main venue for ritual activities, with the door and courtyard always facing south, thus making north-facing residences the most prestigious (Zheng, 1993, p.196).

In practice, however, the orientation of houses in Luoyang Old City was more flexible, influenced by factors such as the street system and the size of the plots. Although north-south orientations were predominant, east-west orientations were also common. Residences facing north-south tended to have greater depth, with most having three or four courtyards in series, and the homes of prominent families

all followed this orientation. In contrast, east-west residences were shallower, with a maximum depth of about 50 meters, and typically had two courtyards. These east-west houses were concentrated along the city's main streets, suggesting that their orientation may have been chosen to maximize street frontage for commercial purposes. Additionally, the smaller size of east-west homes made them more affordable to build and maintain.

Taking the central cross streets of Luoyang Old City as an example (Figure 2-15), this area served as the city's primary transportation and commercial hub. Based on historical maps such as *The Map of Luoyang City and the Four Gates* and aerial photographs from the 1940s, we can deduce the overall urban morphology of the area. Despite some houses falling into disrepair over time, the courtyard structure of these houses remained relatively intact. By reconstructing the layout of the plots they occupied, we can better understand the groupings of courtyard-style houses in Luoyang Old City.



Fig. 2-15 The urban form influenced by the layout of the courtyard housings.

2.3.2 Official and ceremonial buildings

In ancient Chinese cities, while there may be no direct counterparts to Western churches, palaces, or basilicas—structures that symbolized religious or secular power and often stood as urban landmarks, dominating the skyline and featuring grand external plazas and elaborate interiors—it is not difficult to find functionally and symbolically similar buildings. For instance, in traditional Chinese cities, administrative offices, ancestral temples, and ceremonial buildings reflected the city's role as a center of governance, politics, culture, and even religious belief. In Chinese city maps, these buildings are often the primary features depicted, sometimes the only information shown apart from the surrounding landscape, city walls, and gates.

The differences in the forms of special buildings between ancient Western and Chinese cities can be explained by several factors. First, the use of wood as the primary building material in China meant that structures were not built for vertical grandeur or permanence. This resulted in a natural cycle of building replacement. Second, in Chinese thought, cities were not seen as the cradles of civilization in the same way they were in the West. Elite scholars and officials did not pursue monumental urban landscapes. Moreover, in traditional Chinese views, the importance of a building was not necessarily determined by its physical appearance, but by its location and historical significance. Buildings gained their status and symbolic importance by being placed in auspicious locations, according to ritual standards, and by their association with the past. In other words, in traditional China, what held significance and memorial value was not the “building” itself, but the location.

These differences between China and the West shaped the distinctive forms of their special buildings. In Europe, public buildings were designed to stand out with their towering height and abundant decoration, offering an immediate visual impact. In China, however, whether it was administrative offices or ancestral temples, these structures were more organically integrated into the city’s spatial framework. Like the courtyard houses that followed strict principles of orientation and ritual, the palaces, royal residences, administrative offices, temples, and other public buildings in traditional Chinese cities were also laid out in courtyard formations. They were “uniform courtyard type yet varied in scale” (Zheng, 1993, p.196). Thus, from the perspective of urban morphology, public buildings in ancient Chinese cities generally shared similar forms and heights with surrounding structures, with differences expressed more in terms of location and scale, rather than in skyline or intricate architectural styles.

The government offices and ceremonial buildings in the old city also reflect characteristics above. Chinese cities were demarcated by city walls, marking the boundary between the inner and outer city. As a city symbolizing imperial authority and exercising governance, the space within the city walls was typically a concentrated area for government offices and significant ceremonial buildings. The locations of these buildings varied based on the symbolic significance of spatial orientation within the city.

During the Ming dynasty, Luoyang served not only as the administrative seat of Henan Prefecture and Luoyang County but also as the fiefdom of a Ming dynasty prince. Therefore, the most important building in the city was the princely residence.

According to traditional concepts, among the five cardinal directions—east, south, west, north, and center—“center” was regarded as the most prestigious, followed by “south.” Thus, the princely residence was located near the city’s central area, facing south, with the administrative offices of Henan Prefecture and Luoyang County situated on either side. By the Qing dynasty, Luoyang was no longer a princely fiefdom, and the administrative seat of Henan Prefecture, as the highest local administrative authority, was moved to the city center, while the county office remained in the northeastern corner of the city.

Apart from the main government offices, the locations of other important ceremonial buildings also adhered to the principles of spatial layout. For instance, the City God Temple, dedicated to the deity who protected the city, was located near the western main street close to the city walls. This position was practical because the City God was responsible for safeguarding the city, and certain ceremonies required the deity’s tablet to be paraded through the streets. Convenient access to major roads was thus a critical factor in its location. Similarly, the Confucian Temple, as the highest local educational institution, was situated near

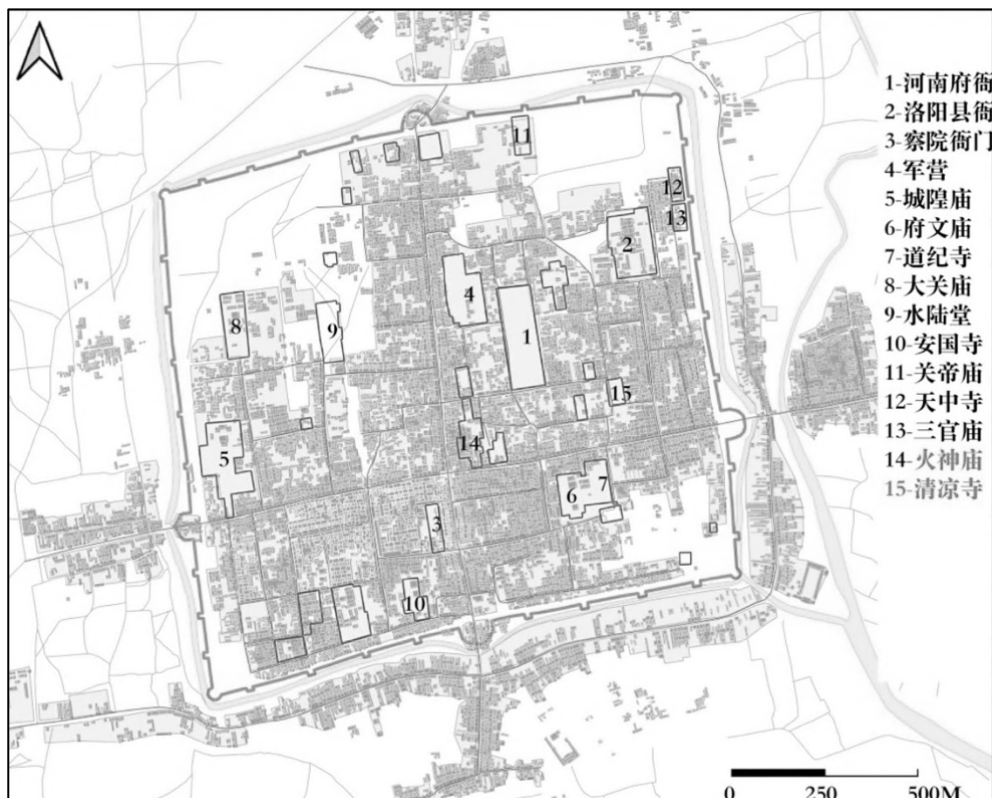


Fig. 2-16 Illustration of the distribution of the governmental and ceremonial buildings in the Qing Luoyang city

the prefectural office in the southeastern part of the city. This location corresponded to the Xun position in traditional cosmology, associated with the Wenqu Star, which symbolized literary prosperity. The Wenchang Pagoda, built to pray for “flourishing cultural achievements,” was also located in the southeastern corner of Luoyang. Its location held similar symbolic significance to that of the Confucian Temple (Figure 2-16).

In terms of scale, higher-ranked governmental and ceremonial buildings, such as regional government offices, academic institutions, and City God Temples, tended to occupy larger areas. These multi-courtyard complexes covered extensive plots of land in the city. In contrast, smaller religious temples dedicated to local deities were more modest in size, with layouts similar to that of a typical courtyard house. These ceremonial buildings blended into the city’s fabric of courtyard houses.

Regarding their spatial arrangements, like courtyard houses, ceremonial buildings also followed traditional principles, adopting a central-axis symmetrical layout and aligning north-south. Unlike residential homes, however, these buildings placed greater emphasis on auspicious placement and ceremonial grandeur. For instance, official government offices and temples would be positioned in prime locations, and their internal courtyards and halls would be arranged to create a sense of ritual significance.

There were generally two types of relationships between governmental and ceremonial buildings and their surrounding environment. First, large-scale buildings, such as government offices, occupied large, independent plots of land, separated from the surrounding residential areas. Second, smaller ceremonial buildings, like those dedicated to folk deities, often had scales similar to ordinary courtyard houses, and their relationships with surrounding buildings could be understood in the same way as residential groupings. It is important to note that because both governmental and ceremonial buildings adhered to the same spatial and ritual conventions as residential structures, even the most important and expansive of these buildings maintained a certain visual consistency with other buildings in the city.

Take the example of the Henan Prefecture Government Office, which occupied a large plot of land (Figure 2-17, left). As the highest administrative authority in the region, it was located at a prime spot within the city. Overall, it was a large, inward-facing, rectangular courtyard complex aligned on a north-south axis. The front of

the complex was used for administrative functions, with the rear reserved for residential quarters. The spatial arrangement highlighted the central axis, with large gates and entrance halls emphasizing the majesty of the state's authority. The office's front section included a main hall, offices, guest quarters, and side rooms, all organized around the central courtyard. Behind the main office was the residential area, where secondary and tertiary courtyards housed living quarters for officials.

In contrast, the county government office, which was lower in rank (Figure 2-17, right), had a simpler layout. Although it also followed the north-south orientation of a rectangular courtyard, its scale was much smaller than the prefectural office. Its spatial arrangement was less elaborate, with no ceremonial arches in the courtyard and fewer auxiliary buildings. The rear residential area had fewer divisions, consisting of only two or three courtyards, and lacked the enclosed gates found in the prefectural office. The academic institution, which served as the center for official education and the veneration of Confucius, had an even more simplified layout.

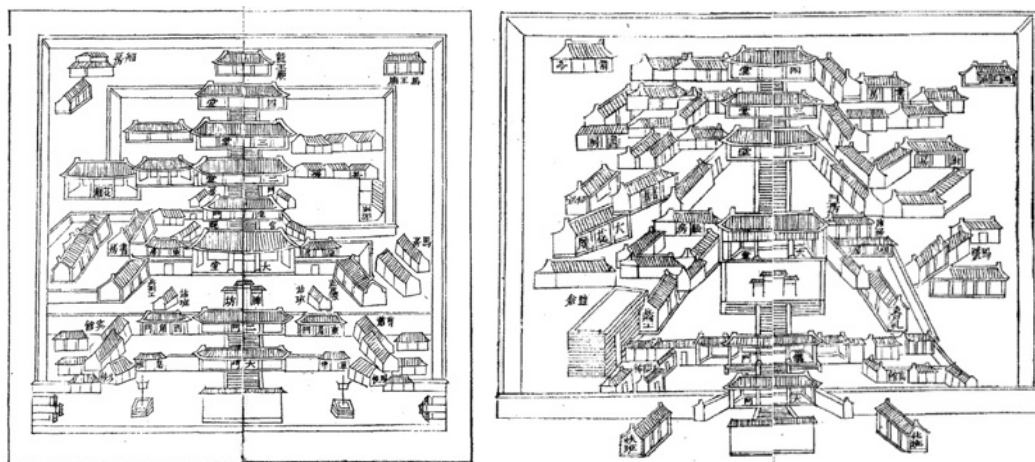


Fig. 2-17 Left: The Henan Prefectural Government Office, located within the city of Luoyang, served as the highest authority in Henan Prefecture. Right: The Luoyang County Government Office, also located within the city of Luoyang, served as the governing body for Luoyang County.

In summary, the governmental offices and ceremonial buildings in late Qing Luoyang shared the courtyard-style layout common to residential buildings, reflecting the same principles of orientation and respect for southern-facing structures. This uniform spatial structure underscored the continuity of ritual norms and spatial organization across different levels of society, from families to local government offices, and up to the highest echelons of state power. This consistency helped integrate various building types into the city's overall environment (Figure 2-18). At the same time, the emphasis on auspicious positioning ensured that

government and ceremonial buildings were distributed throughout the city, blending seamlessly with the surrounding courtyard houses and contributing to the city's stable, continuous urban form.

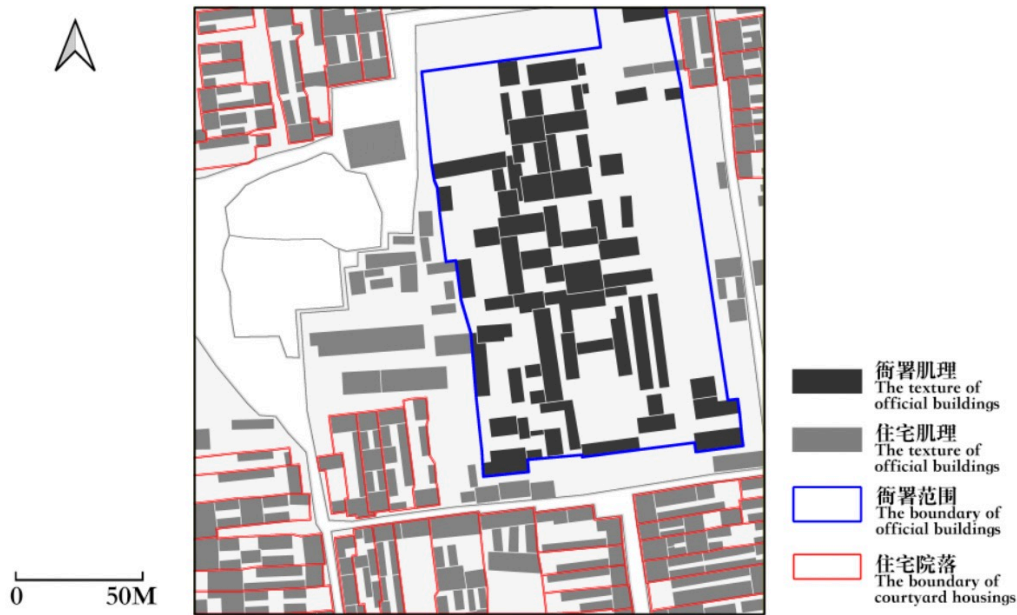


Fig. 2-18 the layout of the government buildings of Luoyang County and the spatial relationships with other courtyard housings around.

2.3.3 Streets and alleys as the living spaces for citizen

2.3.3.1 The hierarchy of the street system of the old city

In describing the road systems of ancient Chinese cities, people often use the expression “Nine streets, eighteen alleys, seventy-two lanes (九街十八巷七十二胡同)” to convey the sheer number and complexity of these roads. This also highlights the classification system used in ancient Chinese cities for roads: “streets” (街), “alleys” (巷), and “lanes” (胡同). “Streets” typically referred to the wider roads, often serving as the city’s primary transportation routes as well as commercial spaces where people gathered, with markets and shops lining the streets. The secondary roads were “alleys” and “lanes.” “Alleys” were often considered to have originated from pathways within the “wards” (坊), or residential districts, of ancient cities. “Lanes,” whose exact etymology is debated, first appeared in Yuan Dynasty Dadu (the predecessor of Beijing) and referred to narrow streets or alleys.

According to the *Records of Xijin* (析津志), the streets of Yuan Dadu (Nowadays know as Beijing) had distinct widths: “main streets” (大街) were 24 bu wide, and “small streets” (小街) were 12 bu wide (Xiong, n.d.). In archaeological findings from Beijing conducted by the Chinese Academy of Sciences in 1965, it was further determined that the width of “fire alleys” was about 9.4 meters, equivalent to “6 bu” in Yuan times, suggesting that the width of a “lane” (胡同) was likely half that of an “alley,” or about “3 bu. (Guangming ribao, 2020)” Thus, the road system of Yuan Dadu can be roughly divided into main streets (24 bu, about 36 meters), small streets (12 bu, about 18 meters), alleys (6 bu, about 9.4 meters), and lanes (3 bu, about 4.5 meters).



Fig. 2-19 Illustration of the main road network of the Qing Luoyang city

Though the dimensions of the streets in Luoyang, a prefecture city, could not compare to those of Dadu, a similar hierarchical system existed (Figure 2-19). It is worth noting, however, that in actual street naming practices, the names did not always correspond strictly to width, and over time, the methods of naming roads evolved. For example, the *Luoyang County Annals* from the Qianlong period of the Qing Dynasty recorded the names of 95 streets and alleys, of which 66 were named “streets,” 6 were named “alleys,” 8 were named “lanes,” and 15 were named using other terms. By the Jiaqing period of the Qing, a new edition of the Annals in

Jiaqing period of the Qing dynasty recorded 48 main streets and alleys, with 10 named “streets,” 10 named “alleys,” 5 named “lanes,” and 23 using other names. By the late Qing, the majority of roads within the city had come to be called “streets.” Therefore, relying on street names alone is insufficient to establish a clear hierarchy of Luoyang’s road system, and street width data must be used to clarify this further.

According to post-1949 records from *Old City District Annals*, 93 streets and alleys were measured for their width, length, and orientation. The widest street was County East Street at 11.3 meters, while the narrowest, Renyi Lane and Lianzi Lane, measured only 2.5 meters wide. Overall, 10% of the streets were over 7 meters wide, 43% measured between 5 to 7 meters, and 47% were under 4 meters wide.

In terms of length, the shortest street was “Shuidaokou Alley” at 67 meters, while the longest was North Street at 1,192 meters. Including the city gate areas, only 12 streets were longer than 500 meters, representing 13% of the total. Another 8 streets were between 400 to 500 meters (8%), 18 streets measured 300 to 400 meters (20%), and 23 streets were between 200 to 300 meters (24%). The remaining streets were shorter than 200 meters (34%) (Zhang, 2014). The reason for this is that the streets were constrained by the city walls, and few roads could exceed the lengths of North Street (1,192 meters), South Street (535 meters), East Street (568 meters), and West Street (676 meters) (Zhang, 2014). Additionally, the city’s streets were often winding and irregular in their layout, possibly for defensive purposes, which limited their length.

In terms of direction, 49 streets ran east-west, 39 ran north-south, and 5 followed other directions. The predominance of east-west streets reflects the layout of residential courtyards (院落), most of which faced south, with their main entrances opening onto the east-west streets. Similarly, residences along north-south streets would be oriented east-west, demonstrating the mutual influence between the orientation of residential buildings and street alignments.

2.3.3.2 Daily activities on the streets

In traditional Chinese cities, streets were not only used for transportation but also served as important spaces for commerce and daily life. Prior to the Tang Dynasty, commercial activities in cities were strictly regulated, with economic transactions restricted to designated “markets”. Even in large cities like Tang-era Chang’an and Luoyang, trade and business were confined to specific areas. However, starting in the Song Dynasty, governmental controls over economic

activities in cities gradually relaxed, and the practice of doing business along streets began to emerge, leading to the rise of the “market streets” (街市).

This change is reflected in the layout of courtyard houses mentioned earlier in the concept of “front shop, back residence” (前店后寝), where rooms facing the street were often converted into shops, either operated by the homeowners or rented out to others. Homes along the main north-south streets even oriented their courtyards east-west to maximize street-facing frontage, facilitating trade along the bustling streets.

Even in the Qing Dynasty, Luoyang maintained its commercial vibrancy, thanks to its location as a hub for water and land transportation. South Street within the city, and the South Gate district outside the city, were bustling with merchants, with shops lining the streets. Thus, streets were not only thoroughfares for transportation but also served as public spaces where daily social and commercial activities occurred (Figure 2-20). This use of streets as commercial spaces persisted into the Republic of China period, as travel writer Ni Xiyong described in his *Luoyang Travel Notes*:

“From Beida Street heading south, I reached the city center (Shizi Street), where there are multistoried buildings with large glass windows, and colorful shop signs hanging across the streets.”
(Ni, 1935, p.75)

Streets also hosted important festivals and ceremonies. For example, the annual “City God Parade” (城隍出巡) was a major event where the City God, as a semi-official figure, played an important role in governance. The parade, which symbolized the unification of officials and the public and reinforced imperial authority, was performed along the city streets.

Additionally, streets were vital spaces for residents’ daily activities. French scholar Jacques Gernet, in his study of daily life in 13th-century Hangzhou, noted that “citizens could witness a variety of performances in the streets.” Chinese urban historian Wang Di further pointed out that streets were spaces for children to play, for performers to entertain, and for residents to socialize. In a time when there were few designated entertainment facilities and public space, streets undoubtedly served as the primary public space.

In conclusion, from a morphological perspective, the primary streets of Qing Dynasty Luoyang preserved the historical layout of the city. These streets had a

certain hierarchy but were narrow in width, primarily serving pedestrians. At the same time, the streets of Qing Dynasty Luoyang were closely integrated with the

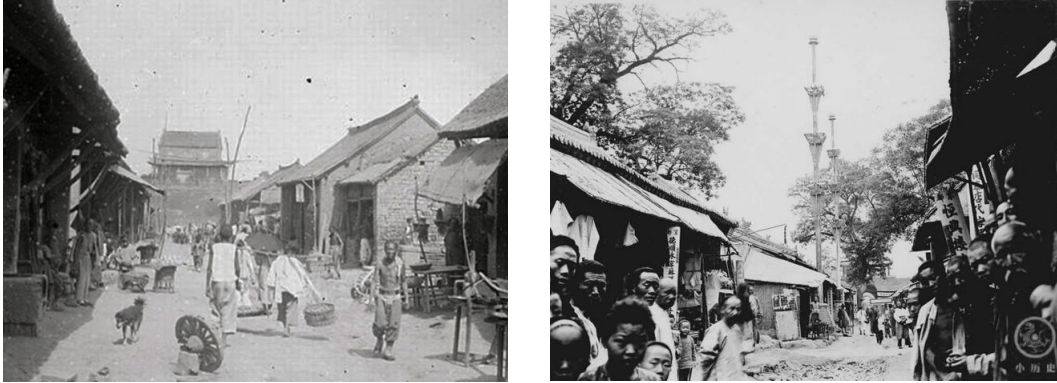


Fig. 2-20 The photographs of the street within the Qing Luoyang city (Source: https://m.163.com/dy/article/I0EJF57S05219RDV.html?spss=adap_pc)

daily life of its residents. Unlike today's more utilitarian view of streets, the streets in Qing Luoyang served as vibrant public spaces, playing an essential role in the cultural life of the city.

2.4 Brief Summary

Influenced by the Chinese traditional urban concepts, the spatial structure of Luoyang remained stable from the Jin Dynasty to the Qing Dynasty, a period of nearly 700 years, without showing any trend of sustained growth. The urban form of the old city of Luoyang conforms to the characteristics of ancient Chinese cities, where the city wall symbolized the city itself and marked its boundaries. The wall divided the city into an inner and outer zone. Within the city walls lay government offices (yamen) and important ceremonial buildings, while outside the city walls, the four city gates corresponded to four out city areas. Under the combined influence of historical, geographical, and traditional factors, the old city of Luoyang developed a distinctive urban form characterized by the pattern of “one city and four gate-areas, dense in the south, sparse in the north.”

From the perspective of urban form components, courtyard-style houses dominated the city's urban form. These enclosed and inward-facing courtyards reflect the traditional Chinese architectural concept of spatial hierarchy and were prevalent throughout the city. In addition to residential buildings, another major category of structures, official and ceremonial buildings, also adopted a courtyard-style layout. However, these official structures occupied larger areas and emphasized the central axis and ceremonial spaces. Beyond architecture, streets

also played a significant role in shaping the city. The streets of the old city not only reflected historical and traditional ideas but also served as public spaces where residents carried out daily activities. Together, residential buildings, official structures, and streets formed the foundational elements of the urban form of the old city of Luoyang.

Chapter 3

Analysis of the military urban form of Xigong during the Republic of China

During the Republic of China period, Luoyang embarked on its first wave of urban expansion, known as the “building a new urban area near the old part of the city” strategy, driven by a backdrop of militarization (Figure 3-1). Beginning in 1914, Yuan Shikai and Wu Peifu consecutively initiated urban construction in the Xigong area. In 1932, the Nationalist Government relocated its capital to Luoyang to avoid the Japanese invasion of the “January 28 Incident (1·28 事件),” pushing Luoyang’s political influence to its peak. During this time, the Xigong area served as the temporary office location for the Nationalist Government in Luoyang, transforming the area from a military camp into an integral part of the city. Until the Japanese air raids in 1937, Xigong remained the focal point for Luoyang’s urban development, with the majority of building activities and infrastructure

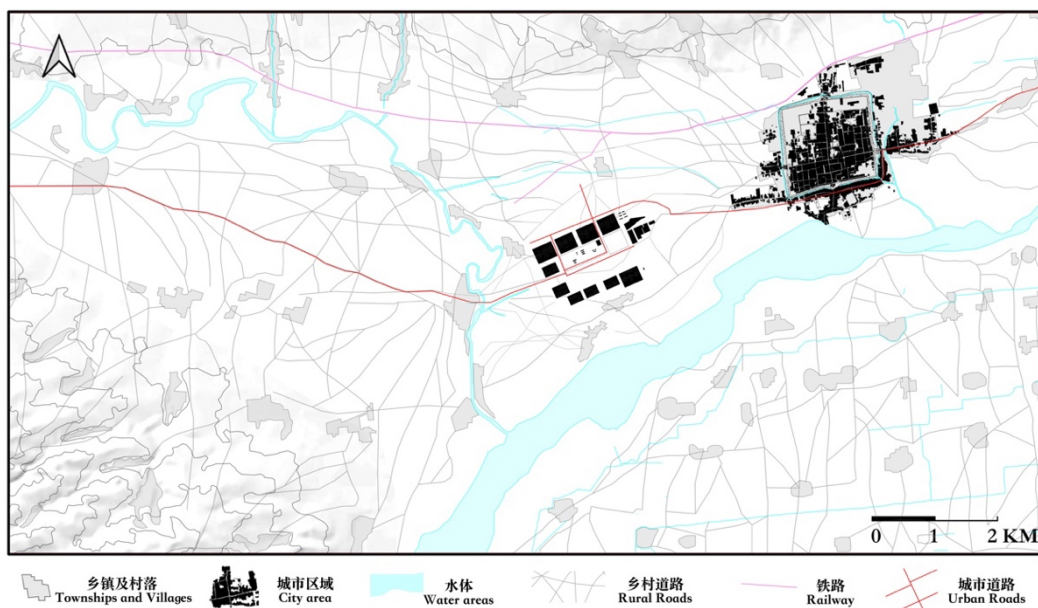


Fig. 3-1 Xigong located at the western of Qing Luoyang city with 2.5 kilometers distance.

improvements concentrated in this area and its surroundings. However, with the onset of the full-scale the Chinese People's War of Resistance against Japanese Aggression, the development of Xigong came to a halt, and much of the construction that had taken place was destroyed by warfare.

This chapter begins by exploring the history of the Xigong area, detailing its development under the successive control of warlord forces and the Nationalist Government. It will then outline the characteristics of military cities throughout history, which is crucial for understanding the factors shaping the “military” urban form of Xigong. Building on this foundation, the chapter will examine the urban morphology of the Xigong area and further analyze the key urban elements that define its spatial form.

3.1 The first time “building a new urban area near the old part of the city”

3.1.1 The construction of the Xigong military camp

3.1.1.1 Reasons for choosing Luoyang for the construction of military camps

The 1911 Revolution (辛亥革命) overthrew the Qing Dynasty, ending thousands of years of imperial rule in China. However, in the early Republic of China period, warlord factions fragmented the country, and the nascent republican government was unable to establish a unified and stable nation. Yuan Shikai, the then-President of the Beijing government, sought to build a centrally controlled military force and identified a suitable location for stationing and training troops. This also served as a potential retreat in case of political downfall (Feng, 2020). This context set the stage for the construction of the “Xigong Military Camp” in Luoyang.

Yuan Shikai chose Luoyang as the military base for several reasons. First, as discussed in Chapter 2, the geographic landscape of Luoyang is naturally defensible, with mountains surrounding the city, making it easy to defend and difficult to attack. The mountains, rivers, and passes around Luoyang have historically made it a strategic military location. While China's transportation infrastructure had advanced by the late Qing and early Republican periods, the natural terrain remained a significant factor in military strategy.

Second, Luoyang was a key transportation hub, connecting the eastern and western regions of China. Historically, Shanxi and Shaanxi merchants often gathered in Luoyang, taking advantage of the region's central location. Looking at the topography between the North China Plain and the Guanzhong Plain, Luoyang is clearly a strategic location. The route from Luoyang through Lingbao to Tongguan was the only flat path for east-west traffic (Figure 3-2).



Fig. 3-2 Luoyang is an important transportation hub on the route from the Guanzhong Plain in the west to the North China Plain in the east.

Third, Luoyang had developed transportation infrastructure, including the Luoyang-Kaifeng Railway (洛汭铁路), which had shortened the travel distance between Luoyang and other major cities in China. As a branch line of the Lugouqiao (Beijing)-Hankou Railway (卢汉铁路), the Luoyang-Kaifeng Railway allowed troops stationed in Luoyang to quickly reach cities along the rail line. Additionally, plans to extend the railway eastward to Xuzhou and Lianyungang and westward to Tongguan and Xi'an highlighted Luoyang's transportation potential (Guo, 2015, p.24). The strategic importance of this railway system would later play a critical role in the Nationalist Government's decision to select Luoyang as a provisional capital (Ma, 2015, pp.13-14).

Lastly, Luoyang's long history as an imperial capital imbued it with a mystical sense of auspiciousness. Located at the center of China's geographic map, Luoyang was considered an auspicious site under traditional concepts like "central location" and "Choosing the center to establish the nation." Although Luoyang had fallen behind commercial and political centers like Shanghai and Beijing at that time, and even lagged behind regional hubs like Chengdu and Chongqing, its symbolic and

cultural significance remained strong. This reflects the continuation of traditional thinking that placed emphasis on location.

3.1.1.2 Military camp construction and the opening of a new urban area

In 1914, Yuan Shikai tasked his son Yuan Keding with preparing for the construction of the military camp in Luoyang (Zhao & Wang, 2020). At the time, Luoyang's inner city and surrounding areas did not have enough space to accommodate a large military base. The only military site within the city was a small drill ground located behind the government office of Henan Prefecture. In fact, by the late Qing period, Luoyang was no longer a significant military training ground for Henan Province, and the drill ground within the city was far too small to meet the demands of the new army. Moreover, Qing dynasty-era drill grounds often served dual purposes as public recreational spaces for residents (Wang, 2019), which was unsuitable for modern military training.

Given these constraints, the military camp was not built within the existing city but instead was constructed about 5 li (approximately 2.5 kilometers) west of the old city (Liu & Dong, 2012). The distance between the camp and the old city ensured that the two areas would not interfere with each other, while still maintaining some level of connectivity. The location choice took into account several factors, including topography, transportation, and land rights (Figure 3-3).

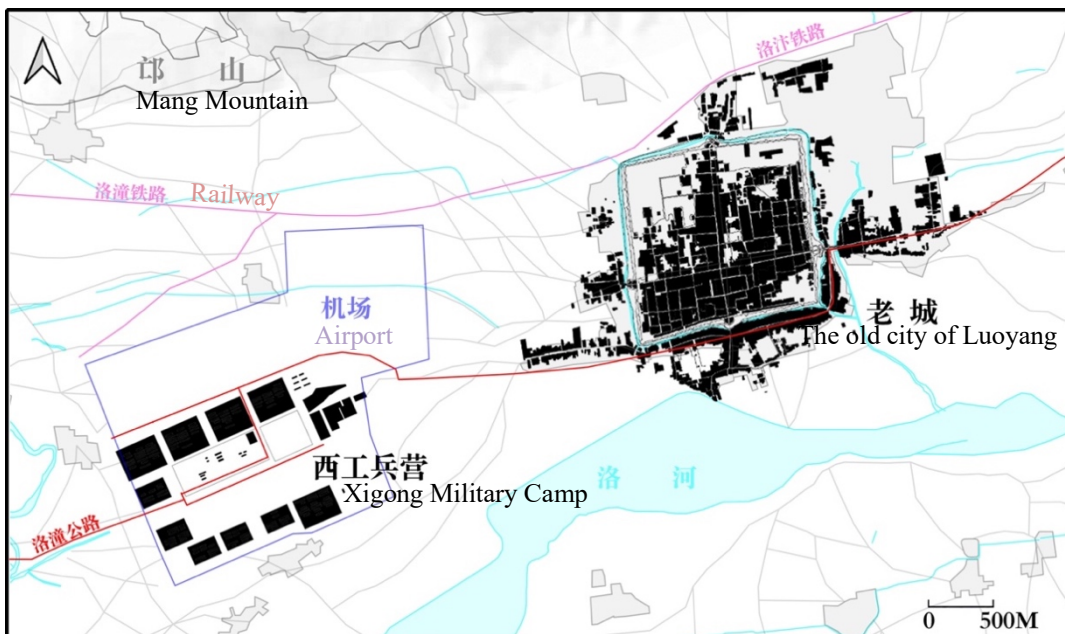


Fig. 3-3: Schematic map of the site selection for the Xigong, with the northern side adjacent to the railway, the southern side adjacent to the Luo river, and avoiding villages

Topographically, the area near Luo River was prone to flooding, especially after heavy rainfall. Although the Luo River's navigability had decreased after the Song dynasty, its flood risk remained. The land near Luo River sloped from west to east, with the higher ground located in the northwest, which had influenced the placement of palaces during the Sui and Tang dynasties. The military camp in the Xigong area was also close to the former palace grounds from these dynasties. Thus, building the camp to the west of the old city reduced the risk of flood damage.

In terms of transportation, both the Luoyang-Tongguan railway and the Luoyang-Tongguan Road (洛潼公路) ran parallel to each other near Xigong, with relatively close proximity. This location offered convenient transportation for military supplies and allowed control over key east-west routes, giving the camp a strategic advantage in securing western access routes.

Land ownership also played a role in the site selection. While the four city gates of Qing Dynasty Luoyang were surrounded by areas with development potential, the land west of the city was largely military property (Zhang, 2014, p.50). Building the camp in this area reduced the need to expropriate civilian land.

Given these factors, the area west of the old city became the ideal location for constructing the military camp. After the site was selected, Yuan Shikai brought in contractors from Shijiazhuang and other areas to oversee the construction of the new-style military camp (Xigongqu renmin Zhengfu, 2017). Because the construction site was located west of the city, it became a bustling work zone, earning the name “Xigongdi (西工地)” (West Construction Site), which was later shortened to “Xigong (西工).” As the area was also the location of the Tang dynasty's imperial palace, it was sometimes referred to as “Xigong (西宫)”¹⁴ which means this area was the former West Palace. In historical documents and travelogues from the Republican period, both terms appear interchangeably to refer to the same area.

At the same time that the Xigong military camp was being built, the Gongxian Armory,¹⁵ located east of Luoyang, also began construction in 1914, reflecting Yuan Shikai's broader military strategy for Luoyang and its surroundings.

¹⁴ In Chinese, “西工” and “西宫” are pronounced the same as Xigong.

¹⁵ Gong County, now known as Gongyi, was originally under the jurisdiction of Henan Prefecture.

By early 1916, the Xigong military camp had begun to take shape. According to a report sent to Yuan Shikai by Major General Yao Jicang on February 18, 1916 (Figure 3-4),

“The construction of the Second Brigade headquarters is 60% complete, and the third and fourth regiments are 50% complete. The barracks are 30% complete, while construction of the cavalry regiment barracks and transport unit barracks has just begun” (Beiyang zhengfu dang’an, n.d.).

However, the report also noted that the construction progress was delayed due to “continuous rain damaging the bricks and tiles” (Beiyang Zhengfu dang’an, n.d.).

Later that same year, the camp was completed, covering more than 4,000 mu (approximately 267 hectares). The brick-and-wood barracks, arranged in neat rows and facing south, numbered more than 5,000 rooms. A “Yingshi Street” (营市街, Military Market Street) and “Gongguan Street” (公馆街, Officers’ Residence Street) were built to serve the camp’s needs (Luoyang wang, 2012). The camp initially housed the Seventh Division of the Beiyang Army, under the command of Zhang Jingyao (Xigongquzhi bianzuan weiyuanhui, 1988). Later, forces from the Northwest Frontier Army under Xu Shuzheng, also part of the Anhui clique, were stationed in the camp. Before the 1919 Zhili-Anhui war, 2-3 brigades of the Northwest Frontier Army were stationed in Luoyang (Han, 2012; Cao, 2016)¹⁶.

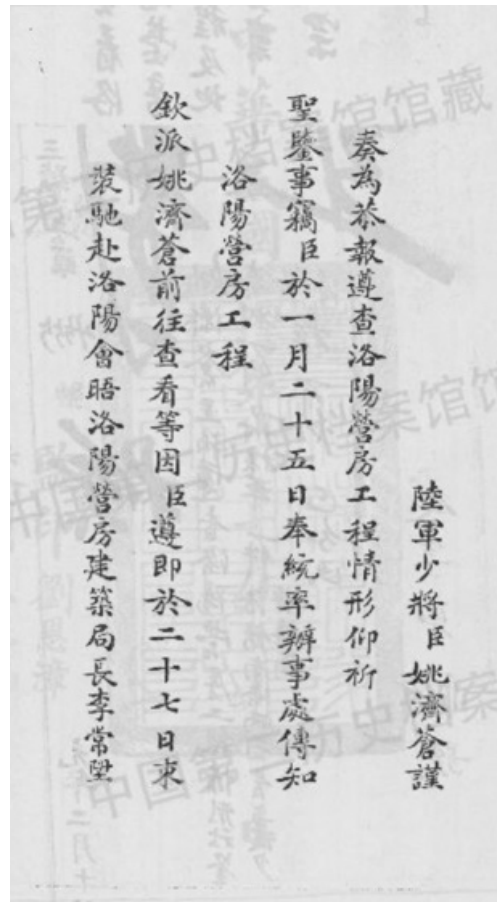


Fig. 3-4: Cover of the memorandum by Major General Yao Jicang on the situation of the Luoyang barracks project, submitted to Yuan Shikai. (Source: <http://180.101.234.209:443/shac/res/layouts/imageDetail.jsp?id=877>)

¹⁶ In 1918, Xu Shuzheng, in preparation for “bringing Fengtian troops to fight Zhili,” established five supplementary reserve brigades. Among them, the 2nd, 3rd, and 4th supplementary

3.1.2 Continued development of the Xigong

3.1.2.1 Expansion of the military camp

After Yuan Shikai's death in 1916, the internal divisions within the Beijing government worsened, exacerbating regional warlordism. Various military factions, seeking to consolidate power and enhance their political influence, carried out construction projects in their respective territories. This reflected a localized centralism approach (Li, 2022), and Luoyang experienced further development within this historical context.

In 1920, Wu Peifu, a warlord from the Zhili clique (直系军阀), defeated Duan Qirui of the Anhui clique (皖系军阀) and was appointed as the “Deputy Commander of the Zhili-Shandong-Henan Military Inspectorate (直鲁豫巡阅副使).” Wu chose Luoyang as his base for several reasons. First, Luoyang's central location in China allowed it to serve as a strategic point, offering both offensive and defensive advantages: “occupying the center to guard against external threats.” Second, Luoyang was distant from Beijing, enabling Wu to maintain a semi-independent status while appearing not to interfere in national politics. His strategy of “occupying central Luoyang and looking down upon the world” helped him maintain autonomy (Feng, 2020, pp.134-139). Wu also considered Luoyang's rich cultural history, believing it to be an auspicious “birthplace of dragons” and calling it a “land of prosperity.” Additionally, Luoyang's existing infrastructure—such as the completed Xigong Military Camp and the nearby Gongxian Armory—made it a prime location for military preparations. The region's large population also facilitated recruitment (Feng, 2020, p.134).

During his time in Luoyang, Wu Peifu focused heavily on military training and quickly expanded his forces (Feng, 2020, p.137). His military headquarters in Luoyang housed numerous departments, with over a thousand advisors alone. Within just a few years, Wu's army had grown to over 100,000 soldiers. As the first Chinese figure to appear on the cover of *Time* magazine, Wu was referred to as “The Biggest Man in China” (Figure 3-5).¹⁷ While stationed in Luoyang, Wu Peifu expelled other regional warlords from Henan Province, including Zhao Ti and Feng

brigades were stationed in Luoyang, the 1st supplementary brigade was stationed in Xinyang, and the artillery unit was stationed in Langfang.

¹⁷ Due to the rapid expansion of his power, Wu Peifu was once regarded by the public as the warlord most likely to unify China during the era of warlordism.

Yuxiang, solidifying his control over the province. His influence extended to Hubei and northwestern China, with Luoyang becoming the center of his political and military operations. His power grew to the point where all significant decisions were made from Luoyang, leading some to believe he had aspirations of unifying the entire nation (Feng, 2020, p.139).

In 1923, Cao Kun, another member of the Zhili clique, became President of the Republic of China, and Wu Peifu was promoted to Commander of the Zhili-Lu-Yu Military Inspectorate. That same year, Li Jichen, a fellow Zhili warlord, was appointed governor of Henan Province and relocated the provincial government from Kaifeng to Luoyang. These developments reflected the growing political and military influence of Luoyang, which had become the political center of a vast region under Wu Peifu's expanding control.

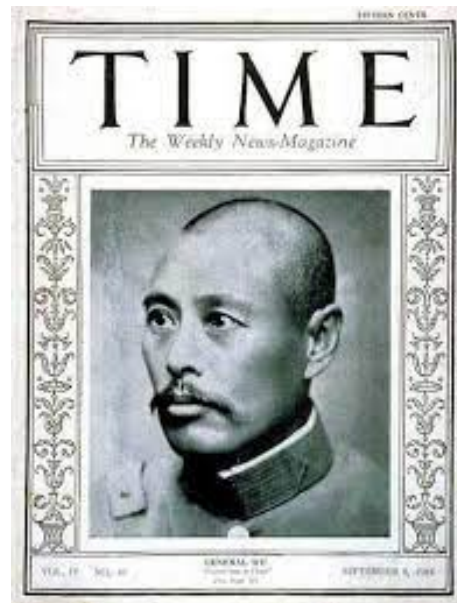


Fig. 3-5: Wu Peifu on the cover of Time magazine, described as 'Biggest man' in China. (Source: <https://content.time.com/time/covers/0,16641,19240908,00.html>.)

3.1.2.2 Infrastructure development and public services

Like other warlords, Wu Peifu initiated infrastructure projects during his administration in Luoyang, though these were primarily focused on the military camp. To accommodate the growing number of employees at his military headquarters, Wu expanded the command center and opened new office spaces. Over 100 new homes were built along Gongguan Street to house military officers (Luoyang wang, 2013). As his troops expanded, the Xigong Military Camp also grew in size, with its area extending by an additional 1,000 mu (approximately 67 hectares) and the number of barracks increasing from 5,000 to over 12,000 (Feng, 2020, p.134). Near Xiacun Village, not far from the camp, Wu ordered the construction of over 1,000 cliff-side cave dwellings to serve as barracks for trainee soldiers (Wang H, 2021, p.49).

In addition to the military camp, Wu focused on building infrastructure related to military operations. As early as 1919, his Zhili forces began constructing a rail line linking the Longhai Railway to the military base and building a new military

platform. In 1920, he built a waterworks facility near the Qili River to supply water to Xigong and established an airfield in the northeastern part of Xigong, marking the beginning of aviation development in Henan (Wang H, 2021, p.49). In 1923, to enhance communication and control, Wu installed a radio station at the Xigong Military Camp.

Wu Peifu's expansion of Xigong also improved transportation infrastructure around Luoyang. He built motorways connecting Luoyang to nearby counties, repaired the road to Tongguan, reinforced the bridge across the Jian River west of the camp, and, in 1922, constructed Tianjin Bridge—the first reinforced concrete bridge to span the Luo River in Henan Province (Figure 3-6). In terms of public transportation, 1924 saw the introduction of a public bus line connecting Xigong and the old city's Beiguan train station (Ma, 2020, p.127), marking the beginning of public transportation in Luoyang. Wu also beautified the area by paving lime roads connecting the train station to the old city, planting trees along the roads, and assigning the head of Luoyang's agricultural school to manage these beautification efforts.



Fig. 3-6: The Tianjin bridge built by Wu Peifu spanning the Luo River, also known as the 'Lao Wu Bridge.' (Source: <http://news.lyd.com.cn/system/2013/12/18/010293442.shtml>)

In September 1924, Wu Peifu left Luoyang to command the Second Zhili-Fengtian War (直奉大战). During his absence, Feng Yuxiang and other dissident Zhili forces launched the "Beijing Coup" against him. Defeated and out of power, Wu returned to Luoyang, only to be driven out later that year. Although Wu briefly regained control of Luoyang between March 1926 and May 1927, the city's development had already stagnated due to continuous military conflict. In summary, although Wu's development projects in Luoyang were primarily centered around

the Xigong Military Camp and aimed at consolidating military power, these efforts undoubtedly contributed to Luoyang's modernization and laid the foundation for its future growth.

3.1.2.3 Luoyang's development after Wu Peifu's fall

In April 1927, Feng Yuxiang joined the Nationalist Party's Northern Expedition, leading his troops from Shaanxi into Henan and occupying Luoyang in May. Unlike his earlier clashes with Wu Peifu, this time Feng represented the Nationalist government, and the occupation of Luoyang signaled the city's incorporation into the Nationalist sphere of influence. The regional warlordism that had plagued the area came to an end. In June 1927, Feng Yuxiang was appointed governor of Henan Province. During his administration, Luoyang saw relatively little urban development, but Feng's reforms brought some improvements to the city's appearance and the lives of its residents (Li, 2017, p.60).

Feng Yuxiang's reforms focused on cultural modernization, addressing issues of public welfare, and beautifying the city. His government encouraged women in Luoyang to cut their hair and unbind their feet, converted temples and Taoist monasteries into schools, and promoted education in both urban and rural areas. Feng's administration also established anti-opium centers and public education halls to improve citizens' quality of life. In terms of urban beautification, Feng's efforts included planting trees, constructing waterworks, building roads, and opening parks (Li, 2017, p.60).

After taking control of Wu Peifu's Xigong Military Camp, Feng Yuxiang repaired and renamed it Xinliu Camp (新柳营) and used it as a training center for junior officers (Xigongqu renmin Zhengfu, 2017). This transformed the Xigong area from a military garrison into a training facility, weakening its role as a defensive stronghold and paving the way for the area's diversified development in the future.

3.1.3 Utilization during the provisional capital period

3.1.3.1 Background of the National Government's relocation to Luoyang

In 1932, following the "January 28th Incident," the Japanese fleet moved up the Yangtze River, posing a direct threat to Nanjing, the capital of the Nationalist Government. Faced with this urgent crisis, the Nationalist Government passed a resolution to relocate the capital, intending to move the government beyond "the

range of Japanese artillery” to a safer location while demonstrating their resolve for “long-term resistance” (Ma, 2015, p.11-12). Before deciding on Luoyang, the Nationalist Government considered five cities—Luoyang, Wuhan, Beiping (Beijing), Xi’an, and Chongqing. Beiping was vulnerable to Japanese forces from the northeast, Wuhan was susceptible to attacks from the Japanese fleet along the Yangtze River, Xi’an lacked a rail connection and had poor transportation, and Chongqing was not fully under the Nationalist Government’s control. By contrast, Luoyang, with its long history, central location in China, and the infrastructure built by Yuan Shikai and Wu Peifu, emerged as the ideal choice (Ma, 2015, p.13).

On January 30, 1932, Lin Sen, the Chairman of the Nationalist Government, decided to relocate the government to Luoyang. Together with Premier Wang Zhaoming (Wang Jingwei, 汪京卫), they signed the *Declaration of the National Government’s Relocation to Luoyang* to announce that “the government, to exercise its authority freely and without coercion, has decided to move to Luoyang” (Xie, 2022). On the same day, Lin Sen led a delegation of 1,000 government personnel to Luoyang (Ma, 2015, p.14). By the end of February, the Executive Yuan of the Nationalist Government had established the Luoyang Administrative Design Committee (洛阳行政设计委员会) to further plan the city’s development. On March 6, the Kuomintang held its Fourth Central Committee Meeting in Luoyang, designating Luoyang County in Henan Province as the provisional capital(行都) and Chang’an County in Shaanxi as the secondary capital.

The Nationalist Government’s relocation to Luoyang was not only a strategic retreat from the Japanese threat but also part of a broader goal to “revive the Central Plains” and promote development in the northwestern region. At the time of the government’s initial move, only the recently developed Xigong Military Camp had a relatively modern appearance, while the old city of Luoyang was in a state of disrepair. Luoyang County had a population of approximately 70,000, and the city’s infrastructure was severely outdated:

“The city’s material supply was no better than that of the 15th century, and for the residents of Nanjing accustomed to a higher level of material civilization, life in Luoyang was inconvenient in terms of clothing, food, and shelter.”

Roads in the old city were unpaved, and most transportation was by rickshaw rather than automobile.

In May 1932, China and Japan signed the *Shanghai Ceasefire Agreement* (淞沪停战协定), easing the conflict in the Shanghai region. As the situation stabilized, government departments that had relocated to Luoyang gradually returned to Nanjing. On December 1, the Nationalist Government officially issued an order to return to the capital in Nanjing (Ma, 2015, p.15). In total, the Nationalist Government's relocation to Luoyang spanned ten months, although by the end, Luoyang was merely a nominal provisional capital.

3.1.3.2 Urban development during the relocation to Luoyang

The relocation of the Nationalist Government to Luoyang rapidly transformed the city from a relatively quiet town into the political center of China, resulting in improvements in several aspects of urban development.

First, the government fully utilized Luoyang's major existing buildings. The National Government operated out of the Dao Yin Office (formerly the Henan Provincial Office), the Kuomintang Central Committee and the Ministry of Transportation occupied the Xigong Military Camp, the Military Affairs Commission was housed in the Fourth Normal School, the Executive Yuan used the Heluo Library, the Examination Yuan operated from the Duke of Zhou Temple, and the Judicial Yuan was stationed at the Luoyang District Court (Ma, 2015, pp.51-52). Thus, local government offices and schools were quickly repurposed into central government institutions, and both the Xigong area and the old city became integral parts of the provisional capital of Luoyang.

To maintain communication with the capital, Luoyang opened a direct express train service to Nanjing. Additionally, the existing Xigong Airport was used to launch passenger and postal air routes on April 1, 1932, facilitating the transmission of government orders and the movement of personnel. In terms of infrastructure, the National Government initiated road construction, bridge building, and waterworks in Luoyang. They repaired the old power plant, restored the city's electricity supply, resurfaced roads, established public transportation, and improved the residents' travel experience. New parks and the restoration of historical sites enriched the leisure activities available to citizens. With the government's presence in the city, patriotic slogans appeared on the streets, reflecting the progress of propaganda and education efforts (Ma, 2015, p.58). Moreover, with the relocation, several communication agencies and newspapers that were previously based in Nanjing set up branches or offices in Luoyang, contributing to the rapid growth of the city's media industry.

In terms of public safety, the police force in Luoyang was expanded, with new police posts established along the route from the old city to Xigong, improving urban security. The Construction Committee organized efforts to enhance sanitation, build clinics, improve public toilets, and clean the drainage system, raising the overall public health standards in the city.

3.1.3.3 Plans and actions during Luoyang as a Provisional Capital

Before the Nationalist Government officially returned to Nanjing in December 1932, the 47th Executive Meeting of the Kuomintang's Fourth Central Committee, held on November 17, approved the "Proposal for the Construction of Chang'an as the Secondary Capital and Luoyang as the Provisional capital (切实进行长安陪都及洛阳行都之建设事宜案)," submitted by Chiang Kai-shek and 25 other members. The key points regarding Luoyang were:

(1) Establish a branch of the Central Military Academy by renovating the old Xigong barracks. The goal of this academy would be to train personnel for both military and agricultural development, merging military and agricultural education to improve the military situation in the northwest, develop land, and strengthen national defense. The academy would also help maintain public order in Luoyang and educate the local population.

(2) Establish the Zhongyuan Social Education Hall to promote public education, improve society, and stimulate industry.

(3) Build the National Zhongyuan Museum at a local historical site to enhance Luoyang's cultural value and support the local economy.

(4) Restore the Luoyang Bridge, a vital infrastructure project for the city's residents and a historical landmark. The bridge had been destroyed by floods, and its reconstruction would both serve the people and commemorate the government's move to Luoyang. (Shannxi difangzhi bangongshi, n.d.)

Although the Nationalist Government returned to Nanjing on December 1, they kept personnel stationed in Luoyang to oversee the maintenance and repair of government buildings and barracks. The proposals mentioned above were mostly

implemented in the following years. In 1933, a branch of the Central Military Academy was established in Xigong. Soon after, the Aviation School, originally located in Hangzhou, was moved to Xigong and renamed the “Luoyang Aviation School.” In the same year, the Zhongyuan Cultural and Social Education Hall was founded on the original site of the Zhougong Temple, with support from the Northwest Agriculture and Forestry Academy. In 1936, the Nationalist Government built the Lin Sen Bridge across the Luo River to replace the Tianjin Bridge, which had been destroyed by floods during Wu Peifu’s tenure. They also constructed the Zhongzheng Bridge over the Yi River near Longmen, greatly improving the transportation network around Luoyang.

These developments show that the Nationalist Government’s relocation revitalized Luoyang’s stagnant urban growth, which had been at a standstill since late 1924. Although the government did not initiate large-scale construction projects like those of Yuan Shikai or Wu Peifu, it made significant efforts to enhance the city’s cultural infrastructure and public services, further advancing Luoyang’s modernization.

Though few images survive from this period to depict Luoyang’s urban landscape, writer Ni Xiying’s *Travel Notes from Luoyang*, written during his visit in 1935, offers a glimpse into the city’s progress under the “build new cities away from the old” approach, particularly praising the Xigong area. He writes:

“After leaving the old city, one must travel along a tree-lined avenue to reach the Xigong area... It is true—Xigong can rival Shanghai’s Avenue Joffre, though the road is not paved with asphalt, making it slightly inferior. However, as for the scenery along the avenue, Avenue Joffre does not compare.” (Ni, 1935, p.203)

Although this praise might be exaggerated, Ni Xiying’s admiration for Xigong is clear. Comparing Luoyang to Shanghai in those days carried significant weight. Shanghai was a model of Chinese urban modernization, often referred to as the “Paris of the East (Li, 2006, p.405),” and a city filled with modern wonders—Western-style architecture, fast transportation, and electric lights—that symbolized China’s progress toward modernity. American scholar Rhoads Murphey famously noted that “modern China first appeared in Shanghai (Li, 2006, pp.292-293).”

In contemporary studies of Chinese urban history, comparisons between cities and Shanghai during the Republican era often highlighted their modernization

efforts. For example, Zhang Jin, in her study of urban social transformation in 1920s and 1930s Chongqing, pointed out that many Chinese cities looked to the “Shanghai model” as an ideal. A city labeled a “Little Shanghai” would take great pride in that comparison, as it symbolized progress in the modernization process (Li, 2006).

Thus, Ni Xiyang’s comparison of Luoyang’s Xigong area to Shanghai’s renowned Avenue Joffre can be seen as high praise for the development of Luoyang’s urban landscape. Over the years, Xigong transformed from a military base into an integral part of the city. Through successive periods of development under Yuan Shikai, Wu Peifu, and the Nationalist Government, Xigong evolved into a vital urban area, with the presence of national government institutions reflecting Luoyang’s ongoing political significance.

3.2 Causes and characteristics of the urban form of the Xigong

The previous analysis described the origins and development of the Xigong district, a new city area that was born out of military needs and grew with political evolution. This area, initially built for military purposes, gradually transformed into a more general urban center. Despite the gradual weakening of its military function, Xigong retained many aspects of a military urban form, which laid a long-lasting foundation for its continued development and construction.

In this section, we will first review the concepts of ancient “military cities” and late Qing “military camps,” which are essential in understanding the unique characteristics of Xigong’s development and urban form. By examining how Xigong transitioned from a military city to a general urban area, we will further elaborate on its integration into the larger urban framework of Luoyang, ultimately becoming an important component of the city’s structure.

3.2.1 Factors forming the urban form of the Xigong

3.2.1.1 Ancient military cities: Defending through terrain and structured layouts

Throughout Chinese history, numerous military cities were established primarily for defense and troop deployment. These military cities, in their location, construction, and spatial forms, were distinct from traditional cities. As political, economic, military, and social conditions evolved, some of these military cities

were abandoned, disappearing into the annals of history, while others transitioned from single-function outposts into multifaceted urban centers, becoming key regional cities (He & Fu, 2014).

The city of Zhangjiakou (Kalgan), which flourished during the Ming dynasty, serves as an illustrative example of a traditional military city from the Ming and Qing periods. Known as the “Mountain City Beyond the Great Wall,” Zhangjiakou holds strategic importance, evidenced by its Mongolian name Chuulalt Khaalga, meaning “Great Gate (on the Great Wall).” This name encapsulates its unique geographical location and military significance (He & Fu, 2014).

In 1429, during the reign of the Ming emperor Xuande, Zhang Wen, the military commander, rebuilt the fortress town of “Baozili” near the Great Wall and renamed it “Zhangjiakou Fort” or “Lower Fort,” marking the city’s entry into military history. In 1571, the Ming dynasty signed a trade agreement with the Mongols, and by 1613, they had built “Laiyuan Fort” for trade and military purposes. These two forts, situated north and south of each other, formed the core of Zhangjiakou’s urban development.

In terms of urban construction, the Upper and Lower forts of Zhangjiakou, as a military city, differed in form and functional layout from ordinary cities. Regarding the Lower Fort of Zhangjiakou, there are relatively detailed records and illustrations. According to the *Wanquan County Annals* (万全县志),

“Zhangjiakou Lower Fort is located 30 li southeast of the county, with a city wall height of 3 zhang and 2 chi, and a perimeter of over 4 li. It has ten 10 stations and two gates on the east and south sides.” (Zuo, n.d.)

In Russian illustrations of the city of Kalgan, a square city at the foot of a mountain range is depicted, surrounded by walls, city towers, and watchtowers, with densely packed houses inside. These help us form a general understanding of the military city form of Zhangjiakou’s Lower Fort (Figure 3-7).

From a functional and structural perspective, Zhangjiakou initially served as a military city, with its primary functions being defense and war preparedness. The internal space was designated for military troops and their families, and the official institutions were different from those of ordinary cities. This can be clearly seen from the military nature of the administrative offices established within the Lower Fort. Zhangjiakou Lower Fort housed the Chahar Deputy General’s Office (察哈

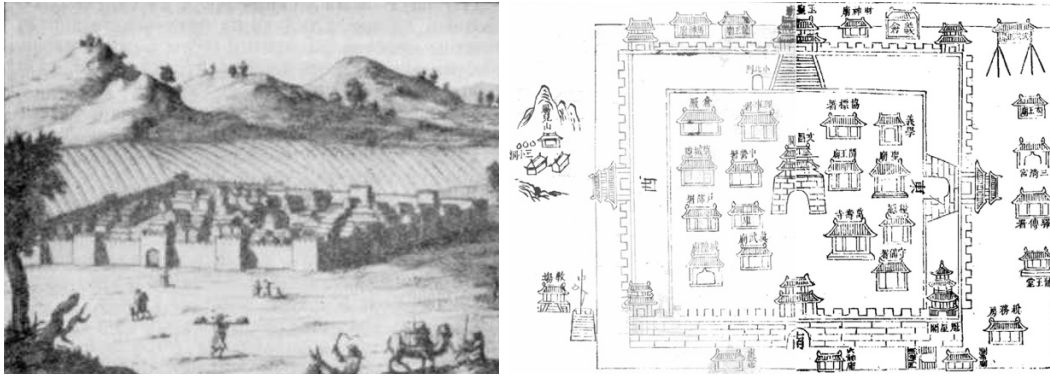


Fig. 3-7 Left: Zhangjiakou fortress in the russian book, Right: The plan of Zhnagjiakou in *Wanquan Xianzhi* (The Annual Records of Wanqaun County) (Source: <https://ctext.org/wiki.pl?if=gb&res=137555>)

尔副都统署), Assistant Commander’s Office (协镇署), Youji Office (游击署), Central Camp Guard Commander’s Office (协标中营守备署), Central Camp Captain’s Office (协标中营千总署), and Central Camp Sergeant’s Office (协标中营把总署), all of which had distinct military functions, unlike the Wanquan County seat to which Zhangjiakou belonged, which did not have as many military institutions.

In terms of construction, besides the official offices, the fort mainly housed military barracks, and the road planning was orderly. In research papers on Zhangjiakou, He Yimin and others pointed out the spatial layout characteristics:

“Zhangjiakou was divided into two parts, the Upper Fort and the Lower Fort. The Upper Fort had the Upper, Lower, East, Mongolian camps, and Yinchengzi, while the Lower Fort had the South and New Camp districts, all serving as military barracks, each enclosed by walls over one zhang high, with gates on all sides. Each alley in the Upper East Camp had ten doors and ten courtyards, with each courtyard having two front rooms and horse stables. Every ten households (户) formed a banner (旗), with one banner leader appointed. The main streets of Upper East Camp and Mongolian Camp were lined with official residences, which were large, tall, and aesthetically pleasing (He & Fu, 2014, p.18).”

During its time as a military fortress, the residents mainly consisted of military officers, soldiers, and their families. After the border situation eased, Zhangjiakou gradually attracted merchants due to its position as a key transportation hub, and buildings with secular functions began to appear. For example, in the 46th year of the Wanli period (1618), a drum tower was built within the fort, and it wasn’t until

the Qing dynasty that the Kuixing Pavilion (魁星阁) was constructed. This functional shift gradually transformed Zhangjiakou from a lower-level military fort into a crucial commercial hub connecting to areas beyond the Great Wall. The rise of commerce and the emergence of various secular functions contributed to the city's status elevation.

In conclusion, as a representative military city of the Ming and Qing dynasties, Zhangjiakou's geographical location demonstrated the defensive strategy of "using natural barriers for defense." Inside the fort, the housing was constructed according to military organization, resulting in a highly orderly urban form with a spatial structure distinct from that of ordinary cities. Later, as the surrounding environment stabilized, the city's transition to a commercial center led to a shift from single-purpose functionality to multifaceted development, showcasing the evolutionary process of a military city toward sustained prosperity.

3.2.1.2 New-style military camps during the late Qing period

By the late Qing dynasty, new-style military camps emerged, bearing some similarities to ancient military cities but with distinct differences in location, development, and spatial organization. These camps inherited traditional elements such as regimented space, organized according to military hierarchy, but were typically larger than ancient military fortresses and often located on the outskirts of major cities. These camps were strategically placed near urban centers with good transportation infrastructure, allowing for future expansion.

One of the most notable examples of such new-style military camps is the Beidaying (北大营, Northern Camp) near Shenyang. It was at this camp that the Mukden Incident of 1931 took place, marking the start of Japan's invasion of China. The Northern Camp, however, had already been constructed during the late Qing dynasty as part of the Qing government's military reforms.

In 1903, the Qing court established the "Training Bureau (练兵处)" to modernize its army, training troops in modern warfare techniques (Dai, 2011). By 1906, this effort culminated in the creation of the Ministry of the Army, which proposed the formation of 36 new military divisions across China, with the Beidaying in Shenyang being one of the largest military installations built as part of this reform. Against this backdrop, the military structure in Northeast China was reorganized, and in 1908, land was purchased 12 li outside Fengtian (now Shenyang) to build the Beidaying.

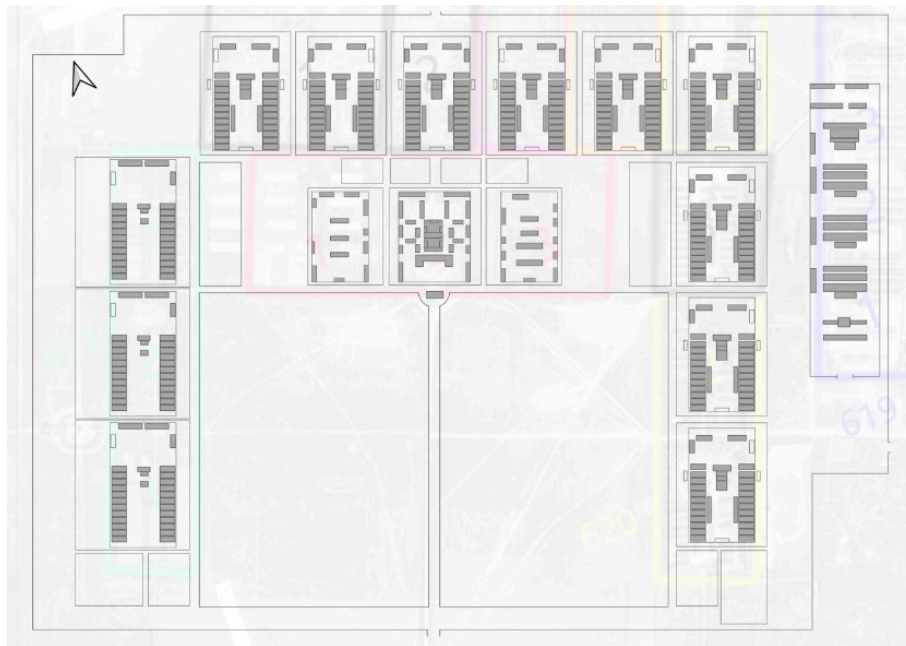


Fig. 3-8: Plan of the Bei Daying (Northern Military Camp) in Fengtian

In terms of scale, the size of Beidaying was comparable to that of a small city (with a perimeter of nearly 12 kilometers, surpassing most county-level cities). The barracks primarily consisted of housing for troops and training grounds, making the overall function relatively singular. In form, Beidaying was a square with each side measuring about 3,000 meters. It was surrounded by a two-meter-high earthen wall resembling city walls, wide enough for people to walk on, and trenches were dug on both sides of the wall (Figure 3-8) (Shi, 2019). Inside the camp, the barracks were divided by regiment, with housing located on the east, west, and north sides of the camp. The barracks on the east and west sides were arranged symmetrically, while the command headquarters, as the central authority, was situated on the central north-south axis, slightly north of the center. To the south of the headquarters was a large-scale parade ground. Architecturally, the camp buildings abandoned the traditional courtyard-style used in older military cities and instead adopted a Zeilenbau layout, which significantly improved the efficiency of military training and preparedness.

In contrast to ancient military cities that were strategically located in defensible terrains, the barracks for the new Qing Dynasty military forces were mainly built near existing cities, which were often provincial capitals or high-level administrative centers. This change in location might have been due to the relatively stable surrounding environment under the Qing government, reducing the need for

the military to defend high-risk areas and instead aligning their location more closely with the city's rank and political importance. In Henan, since the relocation of the "Henan Commander-in-Chief's office (河南提督衙门)" to Kaifeng from Luoyang during the early Qing dynasty, Kaifeng had become a key military base. During the late Qing period, the new army trained in Henan was also stationed in Kaifeng, with a Henan Arsenal (河南机器局) specifically established there to supply the troops with equipment (Yang, 2017).

3.2.2 Characteristics of Xigong's urban form

With the expansion carried out by Wu Peifu, the area of the Xigong military camp further increased, the number of buildings multiplied, and the surrounding infrastructure was gradually improved. Eventually, the Xigong military camp grew to a scale comparable to that of the old city of Luoyang, making it a veritable military city. However, from the perspective of its construction background, the Xigong military camp was a product of a combination of old traditions and new ideas. It incorporated the "old" in its location selection, similar to ancient military cities, while showcasing the "new" in its scale and form, in line with late Qing modernization of military camp construction.

Specifically, the "old" aspect reflected in its location was that the construction of the Xigong military camp continued to embody the characteristics of ancient military cities, which were designed for defensive purposes and control of key transportation routes. Unlike the late Qing practice of establishing military camps mainly in provincial capitals—such as the new armies in Kaifeng for Henan, Wuchang for Hubei, and Chengdu for Sichuan—Yuan Shikai chose to establish a military camp in Luoyang, a non-provincial capital. As discussed at the beginning of this chapter regarding Luoyang's terrain and transportation routes, the camp's location clearly had a strategic defensive element. After Yuan Shikai's death, the internal divisions within the Beiyang faction intensified the warlordism situation, further emphasizing the historical tradition of stationing troops in natural strongholds. Like Yuan Shikai, Wu Peifu also chose Luoyang as his base, utilizing the mountainous and riverine surroundings of Luoyang as a strategic rear area. The camp's location in Luoyang also allowed effective control of the key transportation routes to the east and west, making the Xigong military camp not just a site for regular military training, but a solid fortress in the context of warlordism.

The "new" aspect was reflected in the new construction ideas adopted for the Xigong military camp. First, the camp was built according to the model of new-

style military camps like Beidaying, without repurposing an old city or constructing around an existing one. Instead, it was established on a large open area west of the old city, maintaining close proximity to the old city while leaving enough space for future expansion. Secondly, the spatial organization of the Xigong military camp met the needs of modern military development, reflecting a “form follows function” approach.

Currently, there are few visual records available that clearly depict the overall layout of the Xigong military camp during the Republic of China period. Two relatively clear images include an aerial map of Luoyang from the “Historical Photographs of China” website, jointly created by academic institutions such as the University of Bristol and the British Academy, showing an aerial view of Luoyang captured by U.S. forces (Figure 3-9, right), likely taken before the planned bombing of Japanese forces stationed in Luoyang, dating from around 1943-1945. The other is an aerial photograph from the “National Airport Atlas, Volume II” (1946), archived by Taiwan’s Academia Historica (国史馆) (Zhou, n.d.), which also provides a detailed representation of the urban form of the Xigong area (Figure 3-9, left). These two aerial photographs, especially the latter, have not yet been used

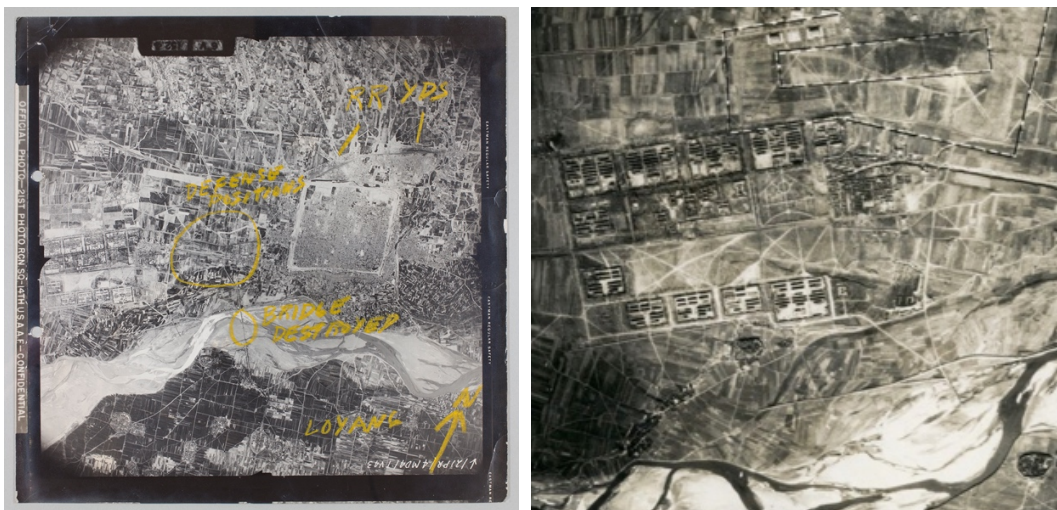


Fig. 3-9 Left: Aerial photo of Xigong By USAF; Right: Aerial photo of Xigong by Airforce of ROC
(Source: <https://hpcbristol.net/search?query=loyang>,
<https://ahonline.drnh.gov.tw/index.php?act=Display/image/4767476hIB8mAN#451>)

in relevant studies on Luoyang’s Xigong area, making them important materials for discussing the “military city” form of Xigong. Based on these images and related historical sources, the overall form of the Xigong area can be inferred as shown in Figure 3-10.

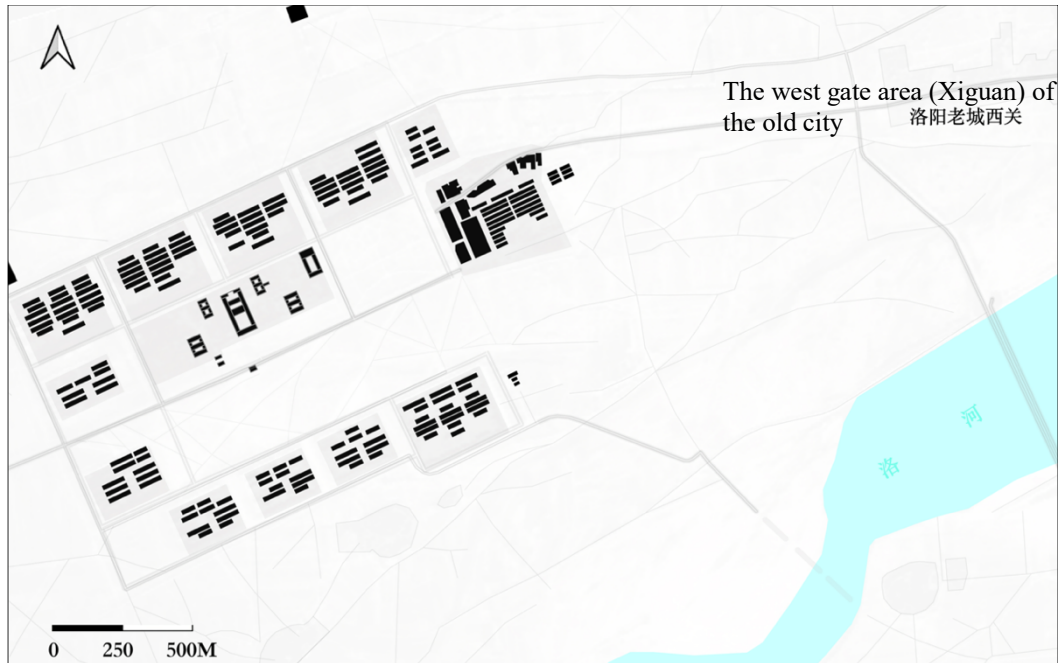


Fig. 3-10 Morphological map of the Xigong

In terms of specific form, the Xigong military camp had a rectangular shape, distinct from the dense and complex urban fabric of the old city. The layout of the Xigong military camp was very clear, with various sections distributed according to the military structure. Four sections were located on the north and south sides, with two sections on the west side, each section containing row-style barracks. On the eastern side of the camp was Gongguan Street, where officers resided, and Yingshi Street, which provided living services for the camp. To the north of Gongguan Street, an Air Force academy and officer residences were later added. At the center of the camp was the headquarters, the core institution of the camp, with a parade ground located to the south of the headquarters.

Unlike traditional military cities with continuous outer walls, the Xigong military camp only had moats on its western, northern, and southern sides, and within the camp, individual barracks were surrounded by walls, with intersecting roads surrounding the various barracks. The Luoyang-tonggaun Road, rebuilt during Wu Peifu's administration, passed through the entrance of the headquarters complex, providing convenient access to the old city of Luoyang to the east.

In summary, the Xigong military camp combined traditional location strategies with modern spatial layouts. It had the strategic “defensible location” of older military cities but adopted the spatial organization of modern military camps. More

importantly, under the “building a new urban area near the old part of the city” construction model, the Xigong military camp was not completely detached from the old city. Both had similar sizes and were located in close proximity, allowing for a certain degree of complementarity. As Wu Peifu’s political influence grew and the National Government temporarily moved its capital to Luoyang, the city’s status continued to rise, promoting the transformation of the Xigong military camp’s functions and its integration with the old city.

3.3 Analysis of the elements of the urban form of the Xigong

3.3.1 Efficiency-oriented barracks

As the most prominent building type in the Xigong military camp, the barracks dominated the overall form of the camp. The Xigong camp, built during Yuan Shikai’s tenure, could accommodate an entire division of troops, as evidenced by the reference to “barracks for the whole division” in *Major General Yao Jicang’s Report on the Status of the Luoyang Barracks to Yuan Shikai*. (Beiyang zhengfu dang’an, n.d.) Based on the composition of the Beiyang Army, a fully staffed division comprised approximately 12,000 soldiers, indicating the scale of the Xigong camp when it was first completed.

The report also provided details on the dimensions and materials of the barracks:

“Each major barrack for divisions, brigades, regiments, and companies has a depth of twenty-two feet, which is approximately seven meters, and each bay spans three meters. The slope of the half-roof is five-sevenths, with beams arranged in rows of seven. Each beam is spaced 1.3 meters apart, and the roof is covered with a mud-lime mixture and overlaid with yin-yang tiles.” (Beiyang zhengfu dang’an, n.d.)

At the end of the report, Yao Jicang remarked, “I have heard that the Luoyang barracks follow the same design as the barracks in Nanyuan, Beijing,” suggesting that the Xigong camp’s design was modeled after the Nanyuan barracks, featuring standardized design (Figure 3-11).

The *Chronicles of Luoyang Architecture*, published in 2004, documented the dimensions of the Xigong barracks:

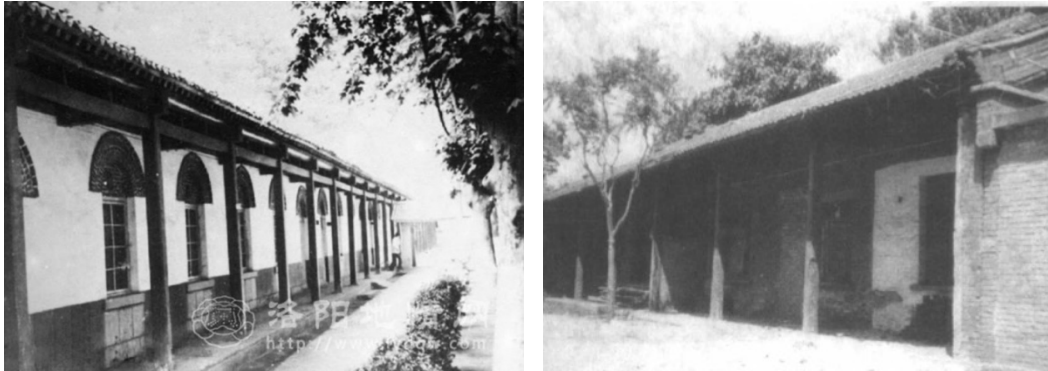


Fig. 3-11 Elevation of barracks in the Xigong Military Camp (Source: *Luoyang jianzhu zhi*)

“The barracks were arranged in rows running east to west, with columns running north to south. All were built in the five-ridge style, with blue-tiled gabled roofs. The front eaves extended to form corridors, most of which were single-sided, though some had double corridors. The buildings predominantly faced south, with each structure containing between 15, 21, and 24 rooms, though a few had only five. Each room was eight meters wide, with a two-meter-wide corridor, and the height from the eaves to the steps was 3.8 meters. The front-back spacing between buildings was 12 meters, while the side-to-side spacing was 15 meters.” (Gao et al., 2004 ,p.94)

In terms of decorative details:

“The wooden doors and windows were designed in a classical Western style, with arched brick headers above the windows. The doors and windows were fitted with glass panes and painted with oil paint, and the floors were paved with tiles.” (Gao et al., 2004, p.94)

According to the distribution map of the Xigong camp’s barracks, during Wu Peifu’s tenure, the camp served as the base for his main forces, the Third Division. The four large regiment areas in the north housed the four infantry regiments, while the southern area comprised three smaller artillery battalions and one larger cavalry regiment. Two smaller regiment areas on the western side were for auxiliary units, such as engineering and logistics. These regiment areas were arranged around the central command post and parade ground, creating a highly organized layout. After Wu Peifu established the air force and constructed an airport, an air force barracks area was added to the camp’s northeast corner (Figure 3-12).

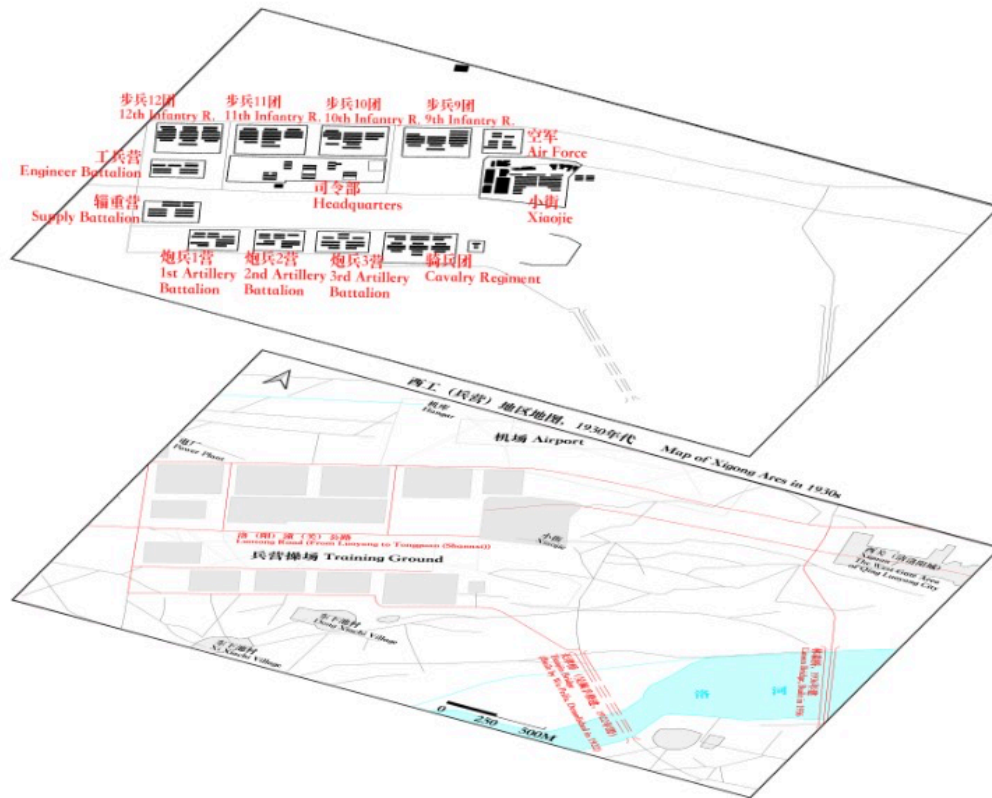


Fig. 3-12 Layout of the Xigong Military camp

Outside the barracks, the second major building type in Xigong was the officer residences. From the beginning of the camp’s construction, the eastern side was designated for high-ranking officers, with residential areas along Gongguan Street. During Wu Peifu’s rule, Gongguan Street was further expanded. According to the *Chronicles of Xigong District*:

“More than a hundred new houses were built on Gongguan Street, and each courtyard was numbered according to the Thousand Character Classic, starting with ‘Tian, Di, Xuan,

Huang...¹⁸ Wu himself lived in the courtyard numbered ‘Tian No. 1.’” (Xigongquzhi bianzuan weiyuanhui, 1988)

The *Chronicles of Luoyang Architecture* described these residences:

“Residences for officers with families were all courtyard-style, with each courtyard housing three families. Each family occupied one side of the courtyard, with three rooms, while the remaining side contained three kitchens, one for each family. All the rooms and kitchens were built in brick and timber. The layout was rational, the buildings solidly constructed, and the overall design practical. Residences for senior officers and their families were built to be more spacious and luxurious.” (Gao et al., 2004, p.83)

During the period when the Nationalist government relocated to Luoyang, these houses were used as residences for government officials. Lin Sen, the then-chairman of the Nationalist government, resided in the same “Tian No. 1” residence originally occupied by Wu Peifu. In addition to traditional-style residences, there were also Western-style two-story villas built as housing for air force officers.

In the Xigong camp, the primary buildings—barracks—broke away from traditional courtyard-style architecture, adopting a simpler structure with a clear and efficient row layout, reflecting a focus on functionality. On the other hand, the high-ranking officer residences retained the courtyard style, reflecting a commitment to traditional values. Meanwhile, the Western-style houses built for air force officers might have symbolized modernization, as the air force, being a modern military branch, required a lifestyle that matched its modern nature.

As analyzed above, Xigong military camp, as a “military city,” exhibited both “old” and “new” elements. The dominant architectural features of the barracks and residences continued this blend of old and new. The different types of residences reflected the balance between efficiency and tradition in Xigong’s development,

¹⁸ Tian (天, Heaven), Di (地, Earth), Xuan (玄, Black), and Huang (黄, Yellow) comes from the opening of the *Qianzi Wen* (千字文, Thousand Character Classic). These are terms used by the ancients to describe the heavens and the earth, representing the fundamental elements of the universe and the world.

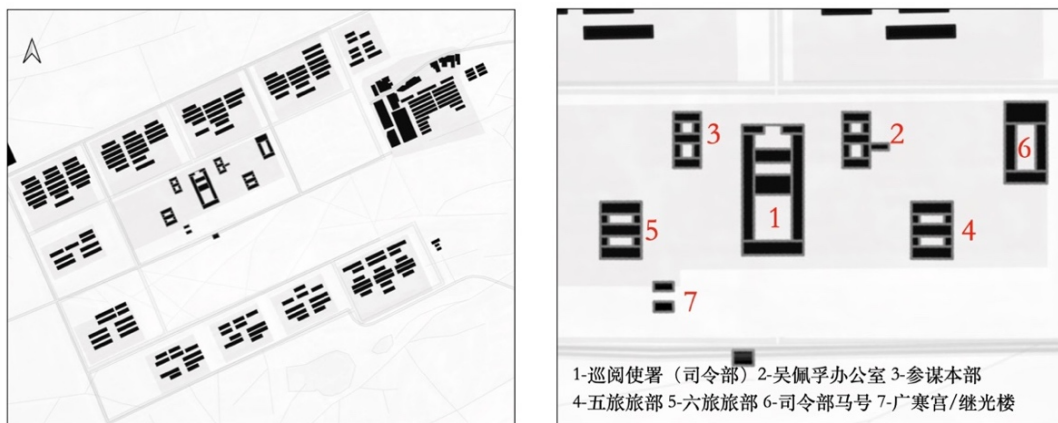
while the incorporation of Western architectural elements represented a symbol of progress at the time.

3.3.2 Traditional continuity in the headquarters complex

The ceremonial buildings of the Xigong area were centered around the command headquarters, which was surrounded by various regimental zones in the military camp. During Wu Peifu’s tenure in Xigong, the command headquarters also served as his office for the “Inspector-General of Zhili, Shandong, and Henan.”

The buildings within the command headquarters predominantly followed traditional courtyard designs. The largest of these was the “Inspector-General’s Office” and the Third Division’s command post, a grand courtyard-style structure. (Gao et al., 2004, p.91) In terms of location, the “Inspector-General’s Office” and the Third Division’s command post occupied the central position in the building complex. The main gate stood on the southern side, opening onto the Luoyang-tongguan Road, which ran through the camp. According to the *Chronicles of Luoyang Architecture*, the southern side of the command post featured four large pillar bases supporting the main gate.

To the northeast and northwest of the command post, there were two smaller courtyard-style buildings. The northeast housed Wu Peifu’s office, next to a high-ranking residential area, with a tunnel connecting the residence to the train station and the airport (Luoyang wang, 2012). To the northwest was Wu Peifu’s General Staff Headquarters. The southeast and southwest corners of the command post were



- 1-Headquarters 2-Wu Peifu’s Office 3- General Staff Headquarters
- 4- Headquarters of the 5th Brigade 5- Headquarters of the 6th Brigade
- 6- Headquarters Stables 7- Guanghan Palace / Jiguang Building

Fig. 3-13 Map showing the location and distribution of buildings in the headquarters compound of the Xigong Military Camp

occupied by secondary command posts, specifically for the Fifth Brigade and Sixth Brigade. In front of the Sixth Brigade's command post, three interconnected buildings known as Guanghan Palace (广寒宫), Jiguang Tower (继光楼), and Jiguang Platform (继光台) were constructed. These buildings served various purposes, including meetings, receptions, and military parades (Figure 3-13).

Wu Peifu's office courtyard to the northeast of the command post has been preserved to this day (Figure 3-14), which helps provide insight into the architecture of the command headquarters during the Xigong military camp period. This smaller courtyard was originally a two-section structure. Based on the remaining part, the courtyard's width is broader than the narrow traditional courtyards typical of Luoyang, with a length-to-width ratio closer to the quadrangles of Beijing. Stylistically, this building adhered to traditional design, reflecting continuity with older architectural concepts. However, like the barracks, some European architectural elements were incorporated into the doors and windows, demonstrating a fusion of Chinese and Western styles.

Another noteworthy ceremonial complex in the Xigong camp was the one formed by Guanghan Palace, Jiguang Tower, and Jiguang Platform. Jiguang Tower, a Western-style brick building, was constructed by Wu Peifu to host visiting guests. In front of Jiguang Tower was Guanghan Palace, originally a courtyard-style cave dwelling. Wu Peifu expanded it by adding 60-centimeter-thick columns around the courtyard to support a roof over the central open area. He also added annexes with windows for lighting. After the renovations, Guanghan Palace was used as the camp's meeting hall, and Wu Peifu personally named it "Guanghan Palace." Behind Jiguang Tower, a review platform named Jiguang Platform was constructed. The platform was recorded as being two meters high, supported by four six-meter-tall red columns topped with a large four-sided roof. The roof was adorned with a



Fig. 3-14 The existing ruins of Wu Peifu's headquarters (Source: <http://wwj.ly.gov.cn/bencandy.php?fid=65&id=1077>)

coffered ceiling and painted decorations. Two towers, seven meters high, four meters wide, and six meters deep, were built at either end of the platform. The Jiguang Platform was connected to Jiguang Tower by a passage, creating an integrated complex that became the site for various important activities at the Xigong military camp. (Gao et al., 2004, pp.92-93)

The Guanghan Palace later became the “Central Hall” during the Nationalist government’s relocation to Luoyang. On March 5, 1932, the Nationalist government convened at the Central Hall to form the Central Military Commission and appoint Chiang Kai-shek as chairman. At the same time, they decided to establish Luoyang as the provisional capital and Xi’an as the secondary capital. From April 7 to 11 of the same year, the government also held the “National Crisis Conference” here, focusing on “resisting humiliation, disaster relief, and pacification.” (Gao et al., 2004, p.92) As a result, this building also became known as the “National Crisis Hall.”

3.3.3 Emergence of modern industrial buildings

In addition to traditional building types such as barracks and residences, the Xigong area also saw the emergence of a new type of construction—industrial buildings. While limited in number and occupying relatively small areas, these structures were technologically and architecturally distinct from the other common buildings in Luoyang at the time. To some extent, they symbolized the modernization process of Luoyang. As shown in [Figure 3-15](#), two of these industrial buildings were located around the military camp: one was a hangar near the airport, and the other was a power plant in the northwest corner of the camp.

3.3.3.1 Hangar

In 1927, the Nationalist government renovated the Luoyang airport and established the “Northwest Aviation Office (西北航空署),” constructing two brick-and-wood aircraft hangars. During the government’s temporary relocation to Luoyang, the city became an important hub for both civil aviation and postal services in China.

In 1934, the airport underwent another refurbishment as part of the Provisional Capital project, with four new reinforced concrete hangars constructed. According to *Chronicles of Luoyang Architecture*, one of these hangars was 56.7 meters long, 38.5 meters wide, with side wings 12.28 meters wide, and an eave height of 8 meters. The single structure had a building area of 2,350 square meters and featured a

reinforced concrete arched framework with a ribbed slab roof structure. (Gao et al., 2004, p.76) Compared to the brick-and-wood buildings common in Xigong and the old city of Luoyang at the time, these reinforced concrete hangars represented highly advanced construction techniques (Figure 3-16).



Fig. 3-15 Industrial building distribution in the Xigong



Fig. 3-16 Exterior and interior of the hangar in the Xigong (Source: *Luoyang Jianzhuzhi*)

3.3.3.2 Power plant

In 1920, the Linyi Electric Lighting Company was established in Luoyang to supply electricity to both the old city and Xigong areas. However, with the outbreak

of the Zhili-Fengtian War in 1924, the plant was occupied by the military and civilians, leading to power outages in the city. After the Nationalist government designated Luoyang as the “Provisional Capital” in 1932, a new power plant project was initiated. In September 1933, Chiang Kai-shek sent officials to Luoyang to survey the site and design a new plant, which aimed to supply 30,000 lamps for the city. This power plant, built in Xigong’s Xiaotun area in 1934, was intended to meet the electricity needs of various institutions, schools, shops, and households in the city, as well as the surrounding rural areas. (Jianshe weiyuanhui, n.d., pp. 2-3)

Once the site was chosen, a division of labor between Beijing and Luoyang pushed forward the design of power lines, equipment procurement, and construction. An engineering committee was established in Nanjing, while an office was set up in Luoyang. After a bidding process, the B.T.H company provided the generating equipment, and the civil engineering works were contracted to the Huazhong Company. The architectural design was overseen by architect Xu Jieyuan. (Jianshe weiyuanhui, n.d., p.55)

In terms of architecture, the power plant’s main building, the turbine room, featured a modern architectural style with a simple exterior and an orderly arrangement of windows on the façade. According to the *Report of the Construction Committee on the Establishment of the Central Military Academy Luoyang Branch Power Plant*, the turbine room and its annex occupied an area of 38 square units, with brick walls 15 inches thick and 72 steel windows provided by the Eastern Company. The building used a 1:2:4 concrete mix, with a wooden truss roof and a flat tarpaper roof (Jianshe weiyuanhui, n.d., p.56). From both a technical and stylistic perspective, this power plant stood out from the other buildings in Luoyang at the time. The report specifically noted, “After the building was completed, visitors from all over praised it highly, calling it the first industrial building of its kind west of Zhengzhou.” (Jianshe weiyuanhui, n.d., p.57) Outside the main turbine building, ancillary facilities like offices and dormitories were designed to meet basic needs and match the military academy environment. Consequently, the office and materials rooms were combined into one building, while the dormitory was housed in a separate building (Figure 3-17).

Before the Nationalist government moved to Luoyang in 1932, construction projects in the city were mainly local efforts. However, after Luoyang became the provisional capital, the responsibility for industrial buildings shifted to central authorities, with funding coming from national military and government institutions. This allowed these industrial buildings to adopt advanced designs and construction

techniques of the time, reflecting the vision of “Developing the Northwest, with Luoyang as the key node” in the provisional capital’s development strategy. (Jianshe weiyuanhui, n.d., p.100)

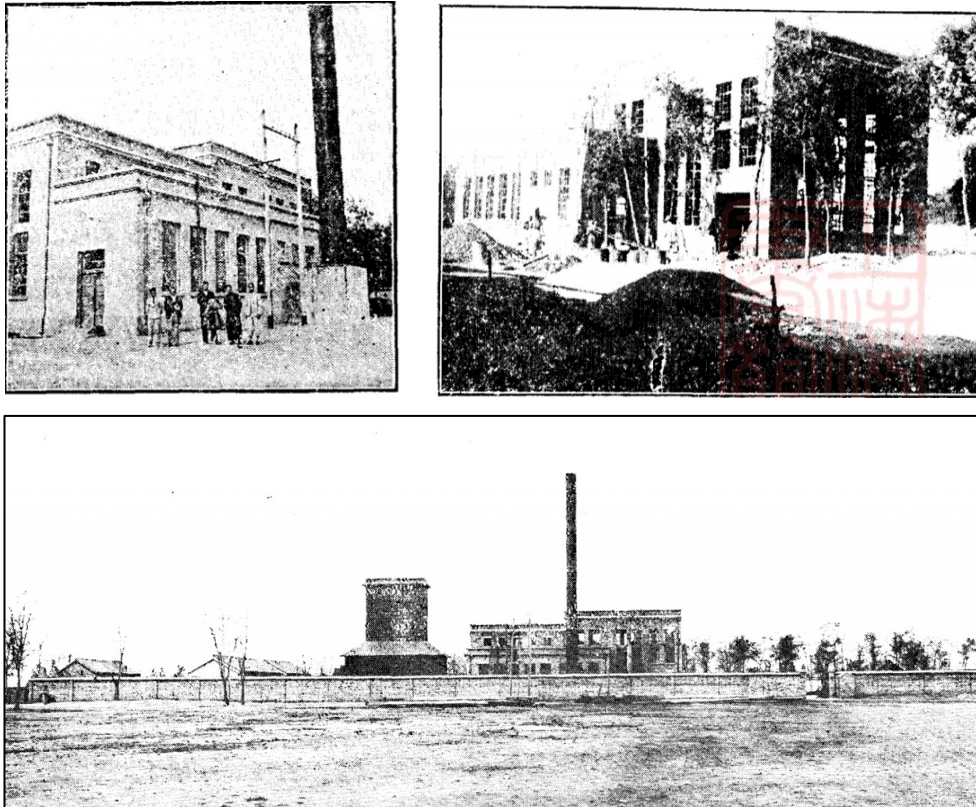


Fig. 4-17 Power plant of the Luoyang branch of the Central Military Academy (Source: <https://mg.nlcpress.com/library/publish/default/BookPicTxtReader.jsp?bookLibID=36&bookID=60826509>)

3.3.4 Preliminary formation of the road system

Compared to the intricate and complex road system of Luoyang’s old city, the road network in the Xigong area displayed a clearer hierarchy (Figure 3-18). This can be analyzed on two levels: external and internal. The external level refers to the main roads passing through Xigong and connecting it to other regions, particularly the Luoyang-tongguan Road. The Luoyang-tongguan Road extended eastward, linking Xigong to Luoyang’s old city, and westward, connecting to Tongguan in Shaanxi, serving as the primary road between Xigong and the old city. Over a decade of development improved its condition, with road paving completed and trees planted along both sides, transforming it into a tree-lined avenue.

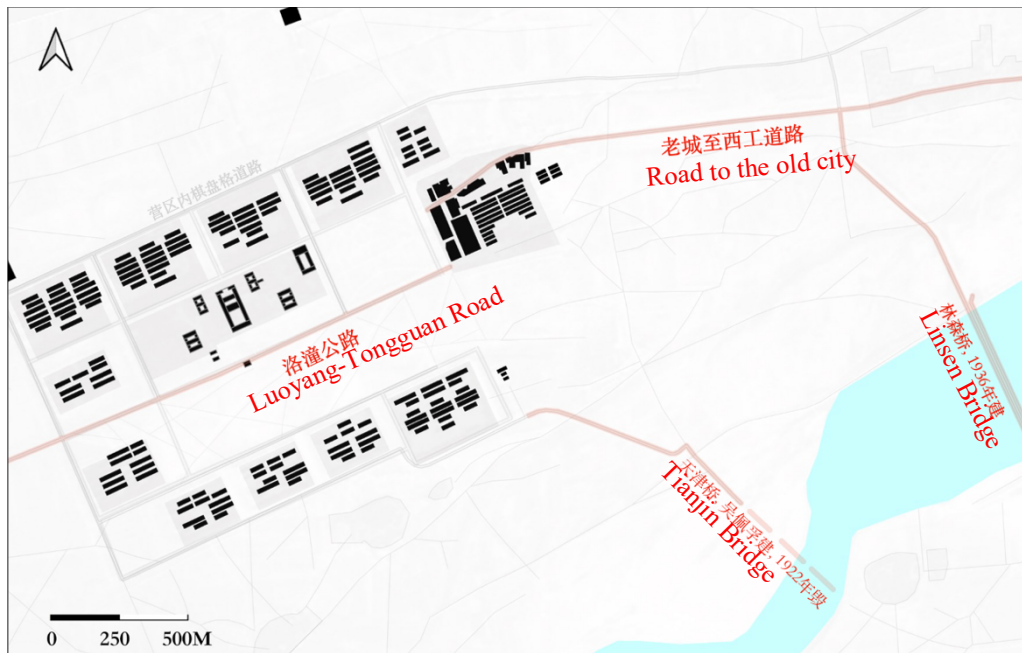


Fig. 3-18 Road network of the Xigong Military Camp

During his travels to Luoyang, Ni Xiyong journeyed from the old city to Xigong and described the avenue he passed in *Luoyang Travelogue*:

“The road to the west is a low-lying avenue, with an ancient-style archway standing in the center, inscribed with ‘Facing the Luo River, backed by the Mang Mountains’ on one side and ‘Connecting Eight Provinces’ on the other. This road was likely a major thoroughfare in the past. There were many people on the road, some heading to Xigong, some returning from it. The bustling scene was like the famous Shanyin Road, quite lively.” (Ni, 1935, p.200)

Upon entering Xigong, the grid-like layout of buildings and crisscrossing internal roads also left a deep impression on Ni Xiyong. He wrote:

“Passing through a bustling market and heading further west, we arrived at Xigong. In front was a broad avenue, crisscrossed like a chessboard street. Trees grew thickly on both sides of the wide avenue, their green leaves shining brightly under the sunlight, the shadows resting on the ground like scattered pieces of silver.

We wandered under the green canopy for a full hour, during which we saw the venue for the National Crisis Conference, the auditorium of the Central Party Headquarters, and the various governmental departments that moved to Luoyang after the national crisis occurred... (Ni, 1935, p.203)”

The “bustling market” Ni referred to was likely the “Yingshi Street” built to serve the military camp, and beyond this was the core of Xigong, the former military camp itself. The various divisions of the military camp were organized by regiment and battalion, and since each unit had a similar number of personnel, the size of each section followed a predictable pattern. These rectangular sections formed a grid-like spatial layout, giving rise to the “chessboard streets” Ni observed (Figure 3-19, left). Inside the camp, the orderly arrangement of barracks further established a secondary grid system of streets.

Compared to the winding and narrow streets of the old city, the road network in Xigong was undoubtedly more suited to modern needs. Unlike the old city, where roads developed organically along historical routes and secondary streets were formed based on the division of building plots, Xigong’s road system exhibited greater logic and was designed to accommodate vehicular traffic, serving the efficiency and strategic objectives of a military city. Furthermore, the grid system formed by the neatly arranged military sections held the potential for future expansion, meaning the city could extend outward in all directions following this layout (Figure 3-19, right).

Overall, the road layout in Xigong directly reflected its “military city” characteristics. This pattern was maintained during the period when the Nationalist government temporarily relocated to Luoyang, and as the new and old parts of the city gradually merged, Xigong became an integral part of Luoyang’s urban fabric. After the founding of the People’s Republic of China, many of the original buildings in Xigong were repurposed, and the existing grid road system was preserved and expanded, continuing the spatial characteristics of its former military city structure.

3.4 Brief Summary

At the beginning of the Republic of China, under the backdrop of warlord divisions, Luoyang was successively regarded as an important military base by Beiyang warlord Yuan Shikai and Zhili clique warlord Wu Peifu. Both initiated and

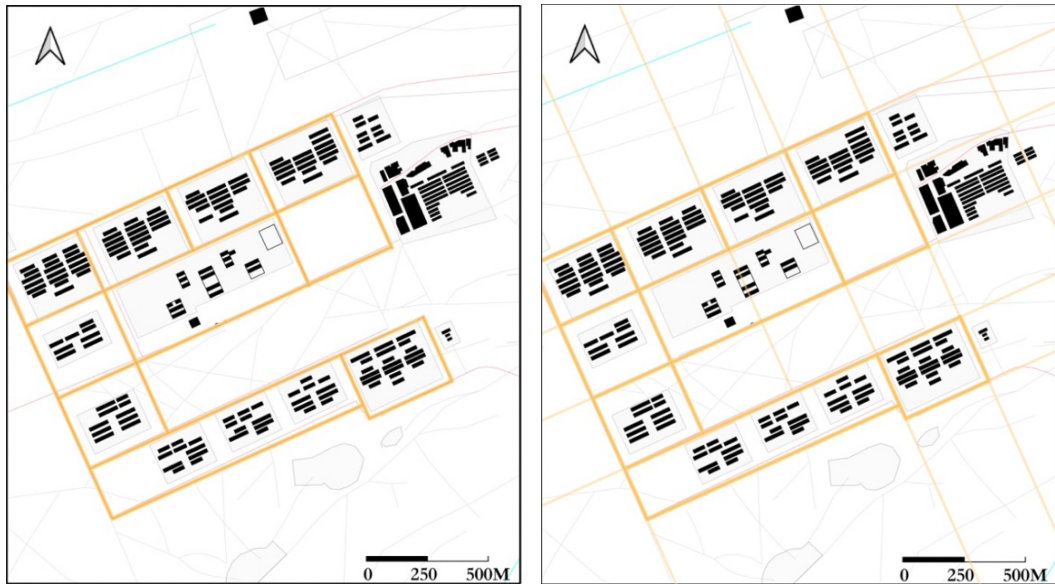


Fig. 3-19 Left: Grid Road System in the Xigong Right: Potential Extensions of the road network.

expanded the construction of the Xigong military camp in Luoyang, adopting the “building a new urban area near the old part of the city” model. This leap in urban development marked the “first transformation” of Luoyang’s urban form in modern history, gradually shifting it from an ordinary local city to a regional center with significant political and economic influence. By 1932, to avoid the chaos of the January 28 Incident, the Nationalist Government chose Luoyang as a provisional capital, elevating its political prominence to its peak.

The Xigong area was the focal point of urban construction in Luoyang during the Republic era, with its form derived from the military camp’s focus on efficiency. From a historical perspective, the Xigong military camp was a combination of tradition and modernity. Tradition was reflected in its adherence to the ancient military city concept of “defending through terrain,” as Luoyang, located at a critical juncture on the east-west passage, had always been a strategic point coveted by military leaders. The modern aspect of Xigong lay in its spatial layout, influenced by the new-style military camps of the late Qing dynasty.

From the perspective of urban form elements, Xigong was originally built as a military camp, with barracks dominating the area’s urban morphology. The camp was organized based on military structure, with neatly arranged barracks laid out in rows within each regiment’s area. These barracks featured a linear layout, combining both traditional and modern decorative elements, reflecting a fusion of old and new. The orderly layout of the barracks and regiment areas resulted in an

orthogonal street grid, which laid the foundation for Xigong's urban spatial structure. It is also worth noting that Xigong witnessed the emergence of a new building type—industrial structures. Although not yet a dominant element in the urban form at this stage, this development foreshadowed the upcoming transformation in Luoyang's industrial structure, signaling further industrial growth.

Chapter 4

Analysis of the industrial urban form of Jianxi in the early years of the People’s Republic of China

In the early years of the founding of the People’s Republic of China, Luoyang was designated as one of the eight key cities for development, taking on the historical mission of spearheading the nation’s socialist industrialization efforts. This spurred Luoyang’s transformation into an industrialized city. In 1954, Luoyang prioritized the planning and development of the Jianxi Industrial zone, marking the second time the city employed the model of “building a new urban area near the old part of the city” (Figure 4-1). From its initial planning stages until the full utilization of its industrial land, Jianxi remained Luoyang’s primary development focus, while the Old City and Xigong were directed to maintain their

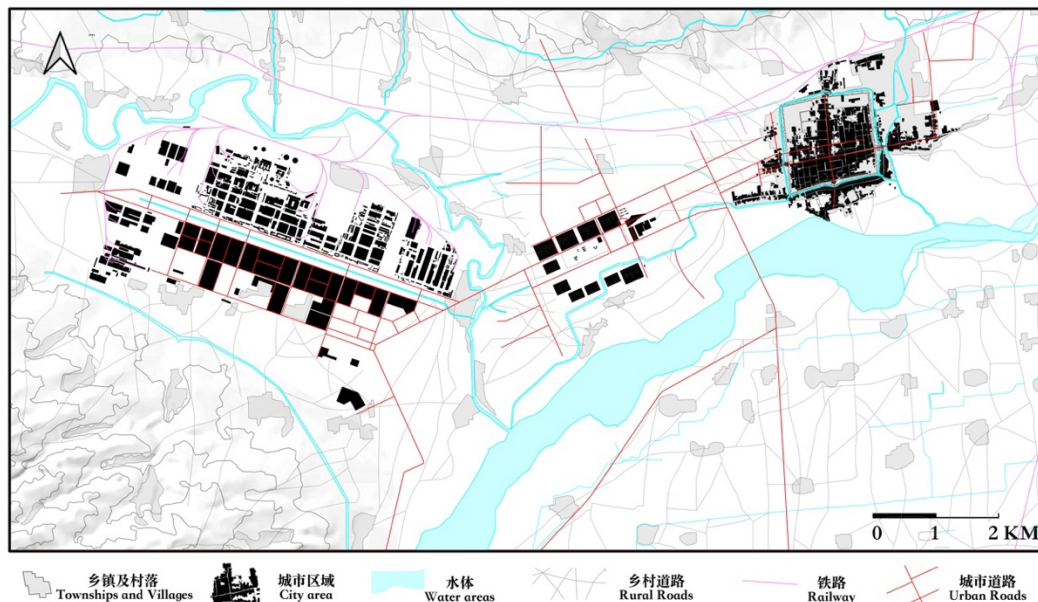


Fig. 4-1 The illustration of the location of *Jianxi* area, showing the outcome of the second instance of constructing a new area adjacent to the old city.

existing conditions. This led to Jianxi emerging as the first area to showcase a modern industrial city form, serving as a model for Luoyang's industrial urbanization and influencing the planning and development of Xigong during the "Second Five-Year Plan."

This chapter begins with an exploration of the urban development strategies of the early People's Republic of China, discussing the significance and impact of Luoyang's designation as a key city. Understanding this context is crucial to explaining Luoyang's rapid development in the early years of the People's Republic. Subsequently, this chapter will delve into the Soviet-inspired socialist city planning concepts, specifically the linear city model, which is essential for understanding the factors that shaped the industrial urban form of Jianxi. Building on this, the chapter will analyze the morphological characteristics of the Jianxi area and further interpret its key urban form elements.

4.1 The Second time of building a new urban area near the old part of the city

4.1.1 Urban development policies in the early period of the people's republic of China

4.1.1.1 The strategy of key development and steady progress

In March 1949, on the eve of the founding of the People's Republic of China, the Chinese Communist Party held its Seventh Plenary Session of the Second Central Committee. The focus of this meeting was to shift the Party's work from rural areas to urban centers, with the goal of transforming "consumer cities" into "productive cities." Mao Zedong's report at the meeting made it clear that "only by restoring and developing urban production and transforming consumer cities into productive cities can the people's power be consolidated." (Mao, n.d.)

From an international perspective, cities played a key role in shaping the identity of socialist countries. Socialism, as an ideology and political system, first took root in urban centers, driven by industrialization and growing labor forces. (Pugh, 2014, p.110) After the success of the "rural encirclement of cities (农村包围城市)" strategy during the revolution, the Chinese Communist Party decided to shift its focus to urban areas at the time of its nationwide victory, aligning with its broader socialist industrialization goals. This shift, both historically and in

comparison to other socialist countries, followed a natural trajectory for national development.

In the broader national context, China adopted the “lean to one side” policy, firmly aligning with the Soviet Union and other socialist countries. This policy had a tangible impact on China’s development across many sectors, including economic strategies that emulated the Soviet model, emphasizing industrialization, especially in heavy industries, as a national priority. (Li, 2016, pp.8-9) In urban planning and architectural design, China also drew from Soviet expertise and practices.

To meet the objectives of “socialist industrialization,” China adopted a strategy of “key development, steady progress” in urban development. Given the emphasis on building a robust heavy industrial base, large-scale urban construction was not feasible due to limited human and material resources. Therefore, focusing on key projects became critical. (Li, 2016, pp.20-21) The guiding principle was that once an industrial foundation and economic strength were established, broader urban development could follow.

The “Eight Key Cities” gradually emerged in this context. In September 1952, the newly formed Ministry of Construction organized the first national urban construction symposium, categorizing cities into four groups: “heavy industrial cities,” “reconstruction cities with significant industrial weight,” “old cities with lesser industrial weight,” and “other general cities.” The “heavy industrial cities” included Beijing, Baotou, Datong, Qiqihar, Daye, Lanzhou, Chengdu, and Xi’an, forming the prototype of the “Eight Key Cities.” (Li, 2016, p.22)

As the planning for “156 Projects” progressed,¹⁹ the 1954 “First National Urban Construction Conference” further categorized cities into four types: (1) “new industrial cities with significant industrial construction,” (2) “expansion cities,” (3) “cities eligible for partial expansion,” and (4) “general small and medium-sized cities.” This formalized the concept of the “Eight Key Cities” and set the stage for their development—determining the priority and level of investment in these cities according to this ranking. The “new industrial cities with significant industrial construction” category included Luoyang and seven other cities (Taiyuan, Baotou,

¹⁹ The 156 Projects, officially known as the 156 Key Industrial Projects (Russian: 156 Ключевых Промышленных Проектов КИП), refer to the key industrial and mining construction projects introduced by China from the Soviet Union and Eastern Europe during the First and Second Five-Year Plans. These projects laid the foundation for China’s modern industrialization. Initiated in 1950, the projects continued until the Sino-Soviet split in 1960, during which 150 of the planned projects were completed.

Wuhan, Datong, Xi'an, Lanzhou, and Chengdu). The conference emphasized that planning for these key cities should be prioritized, stating, "These cities lack an industrial base and public utilities. Once industrial projects are established, modern facilities must be equipped, making them key cities for development during the First Five-Year Plan (Li,2016, pp.22-23)."

4.1.1.2 Site selection and significance of the Eight Key Cities

The defining feature of the Eight Key Cities was their capacity to host multiple heavy industry projects, with Soviet-assisted "156 Projects" being the most important. This industrial focus was the key factor in the selection of these cities.

From the late Qing Dynasty to the Republic of China, China's industrial development was concentrated in northeastern cities, coastal regions, and the three northeastern provinces, leaving inland cities with relatively weak industrial bases (Li M,2019, pp.130-137). The site selection for the Eight Key Cities deliberately avoided coastal areas and the northeastern provinces for two main reasons: first, to reduce the risk of potential warfare along the coast, and second, to promote balanced national industrial development. The report on the First Five-Year Plan emphasized,

"The skewed concentration of industry along the coast is unreasonable both economically and militarily. The long-term interests of the country require distributing industrial production power appropriately across different regions, placing industry near raw material and fuel sources as well as consumption areas, and meeting the conditions necessary to strengthen national defense (Zhonghua renmin gongheguo guojia fazhan he gaige weiyuanhui, n.d.)."

The selection of the Eight Key Cities reflected these considerations of national defense and balanced development. In addition to maximizing the utilization of the northeastern industrial base, the plan aimed to establish three new industrial bases in North China, Central China, and Northwest China, and a fourth in Southwest China. The "Eight Key Cities" were designated as primary hosts for projects under the "156 Projects" in each of these bases. For example, in the North China industrial base, Taiyuan, Baotou, and Datong undertook 11, 5, and 2 key projects, respectively. In the Central China base, Luoyang and Wuhan took on 7 and 3 projects, respectively. Xi'an and Lanzhou in the Northwest base hosted 14 and 6 projects,

respectively, while Chengdu in the Southwest base undertook 5 projects (Table 4-1).

Region	City	Number	Projects name
North China	Taiyuan 太原	11	Taiyuan No. 1 Thermal Power Plant, Taiyuan No. 2 Thermal Power Plant, Taiyuan Chemical Factory, Taiyuan Nitrogen Fertilizer Factory, Taiyuan Pharmaceutical Factory, Taiyuan Radio Factory, Shanxi Xing'an Chemical Materials Factory, Xin Hua Chemical Factory (Shanxi 908 Factory), Jinxi Machinery Factory, Jiangyang Chemical Factory, Fenxi Machinery Factory, Xing'an Chemical Factory, Dazhong Machinery Factory
	Baotou 包头	5	Baotou Sandaoshan River Thermal Power Plant, Baotou Songjiahao Thermal Power Plant, Baotou Steel Company, Inner Mongolia No. 1 Machinery Factory, Inner Mongolia No. 2 Machinery Factory
	Datong 大同	2	Shanxi Diesel Engine Factory (616 Factory), Datong Coking Coal Mine
Central China	Wuhan 武汉	3	Wuhan Steel Company, Qingshan Thermal Power Plant, Wuhan Heavy Machine Tool Factory
	Luoyang 洛阳	7	Luoyang Thermal Power Plant, No.1 Tractor Manufacturing Factory, Luoyang Ball Bearing Factory, Luoyang Mining Machinery Factory, Luoyang Copper Processing Factory, Luoyang Refractory Materials Factory, Henan Diesel Engine Factory (407 Factory, relocated from Shanxi)
Northwest	Xi'an 西安	14	Xi'an High-voltage Insulator Factory, Xi'an Switch Rectifier Factory, Xi'an Insulating Materials Factory, Xi'an Power Capacitor Factory, Xi'an Thermal Power Plant, Shaanxi 113 Factory, Shaanxi 114 Factory, Xi'an Kunlun Machinery Factory (Shaanxi 847 Factory), Shaanxi 248 Factory, Shaanxi 803 Factory, Shaanxi 844 Factory, Shaanxi 843 Factory, Shaanxi 804 Factory, Shaanxi 845 Factory
	Lanzhou 兰州	6	Lanzhou Nitrogen Fertilizer Factory, Lanzhou Synthetic Rubber Factory, Lanzhou Nitrogen Fertilizer Factory, Lanzhou Oil Refinery, Lanzhou Thermal Power Plant, Lanzhou Petrochemical Mechanical Factory
Southwest	Chengdu 成都	5	Chengdu Thermal Power Plant, Jinjiang Electric Motor Factory (784 Factory), Hongming Radio Equipment Factory (715 Factory), Xinxing Instrument Factory (719 Factory)

Tab.4-1 Eight key cities undertake 156 Major Project details

Common features among these cities included strong transportation networks, especially railways, as well as access to resources such as mineral and water resources, making them ideal for production and transportation.

The significance of these key cities lay in their role as the pioneers in transforming China's economy from "consumer cities" to "producer cities." Their urban planning efforts served as models for the rest of the country. These cities also played an essential role in promoting regional industrial development and balancing national productive forces. Moreover, beyond their technical contributions, these cities symbolized a new way of life under socialism. In line with socialist urban planning principles, they were the first to undergo a transformation from pre-modern agricultural cities to modern socialist industrial cities, contributing to China's broader modernization process.

4.1.2 Luoyang as a key city

4.1.2.1 The urban condition before and after the liberation of Luoyang

On March 3, 1948, the Central Plains Field Army and the East China Field Army of the People's Liberation Army (PLA) launched the "Battle of Luoyang (洛阳战役)." On March 15, Mao Zedong drafted a telegram for the Central Committee of the Communist Party of China, celebrating the victory at Luoyang. However, on March 18, the PLA temporarily withdrew from the city, only to return on April 4, launching another attack and capturing the city the next day. On April 8, Mao Zedong drafted another telegram addressed to the Luoyang frontline command post, where he emphasized:

"The city now belongs to the people. Everything should be approached with the mindset that the people themselves are responsible for managing the city. It would be entirely wrong to treat a city governed by the people the same way one would treat a city under Nationalist Party's control." (Mao,1948)

The Battle of Luoyang was the first time since the PLA's shift to a strategic offensive in 1947 that they captured a well-fortified medium-sized city under Nationalist control on the southern front. Its success severed the Nationalists' communication lines between Central and Northwest China, marking a significant step in the nationwide liberation process and signaling that Luoyang's urban development was about to enter a new phase.

However, Luoyang, following its liberation, was in a dire state. After enduring the devastation of the Anti-Japanese War and the Chinese Civil War, the city was even more dilapidated, and the people's living conditions had worsened. This situation can be attributed to two main factors:

Luoyang's strategic location made it a focal point for repeated contention between opposing forces during wartime. In the early Republic era, Luoyang was constantly fought over by various warlords, halting its development. During the Anti-Japanese War, starting in December 1937, Luoyang was frequently bombed by Japanese forces. In 1942, during fierce battles between the Japanese and Nationalist forces in Luoyang, Nationalist troops destroyed infrastructure like roads and power plants to prevent further destruction if Luoyang fell. During the Chinese Civil War, as the Battle of Luoyang approached, Chiang Kai-shek's son, Chiang Ching-kuo, sent a telegram to Nationalist general Qiu Xingxiang, underscoring Luoyang's importance and instructing him to hold the city at all costs. The Nationalist army heavily fortified the city, demolishing thousands of homes within and around the city, leaving over 1,000 families homeless. The intense fighting caused further destruction to the city's infrastructure.

Hyperinflation during the later years of Nationalist rule devastated the lives of the people. By early 1948, just before the PLA took the city, living conditions in Luoyang had already deteriorated. In interviews conducted by *Luoyang Daily* in 2008, eyewitnesses recounted how, during the 1948 Spring Festival, the streets were desolate, there were few visitors, soldiers patrolled the streets with firearms, and the government failed to organize any festive events (Wang, 2008). War-driven inflation caused prices to soar, placing enormous pressure on the residents. According to *A Comprehensive History of Luoyang*, famous local restaurants and businesses began to close down at the beginning of 1948.

After the liberation of Luoyang, these issues were gradually alleviated. The newly established People's Government focused on stabilizing the situation, restoring daily life, and eradicating remaining Nationalist forces. Administratively, the city's governance was clarified, with institutions such as the People's Court being established. Economically, the introduction of a new currency replaced the hyperinflated Nationalist "fabi," stabilizing prices. In industry, the government took over existing Nationalist-run enterprises like the Longmen Coal Mine. Culturally, the Communist Party established the newspaper *New Luoyang Daily* and founded the United Middle School. These measures were crucial for transforming Luoyang from a "Nationalist Party's city" to a "people's city," but significant changes in

urban construction had yet to take place. Wei Shiheng, a member of Luoyang's city planning team in 1954, recalled: "At that time, Luoyang's old city was in ruins. Although it was an ancient capital, there weren't many relics left, just the tomb of Guan Yu. We never heard of any famous scenic spots either (Li, 2017, p.116)."

4.1.2.2 Urban development driven by key industrial projects

As discussed earlier, Luoyang was in a state of disrepair before and after its liberation. Why, then, was it selected as one of the eight key cities for development? This decision hinged on the strategic placement of national industrial projects, particularly the "156 Projects," which were crucial in determining the selection of key cities (Li, 2016, pp.23-27). The National Planning Commission(国家计划委员会), in conjunction with a joint site selection team, chose to locate heavy industry projects such as a tractor manufacturing factory, a ball bearing factory, a mining machinery factory, a Copper Processing Factory, and a thermal power plant in Luoyang. These enterprises were all part of the "156 Projects," with the most significant being the First Tractor Manufacturing Factory (Li, 2016, p.508).

On January 8, 1953, the First Ministry of Machinery Industry (referred to as "First Ministry") issued the "Design Task for the Tractor Factory," which outlined a plan to produce 20,000 tractors annually (Yituo changzhi bianzhu weiyuanhui, n.d.). The following month, the Automobile Industry Bureau under the First Ministry established a preparatory office for the new factory, which began site selection based on input from the Ministry of Agriculture. The initial candidate cities were Harbin, Shijiazhuang, Xi'an, and Zhengzhou (Yu, 2009, pp.2-6).

After investigating these cities, it was determined that while Harbin had vast untapped land and strong industrial conditions, the long winter limited construction time and would disrupt the national industrial balance. Zhengzhou and Xi'an, although secure in terms of national defense, lacked favorable conditions for factory construction. In comparison, Shijiazhuang, located near industrial regions and central to various consumer markets, seemed a suitable location. However, because the tractor factory had a strategic defense role, Shijiazhuang's national defense conditions were deemed inadequate, making defense considerations decisive in the final site selection.

Ultimately, the central government, considering both national industrial layout and defense requirements, directed that the factory should be located in Henan province. Site assessments were then conducted in five locations: Zhengzhou,

Luoyang, Yanshi, Xin'an, and Shanzhou (now the Shanzhou District of Sanmenxia City) (Yituo changzhi bainzhou weiyuanhui, n.d.).

On July 12, 1953, the preparatory office for the Luoyang Tractor Factory was established (code-named Factory 081) (Yituo changzhi bianzhu weiyuanhui, n.d.). On July 15, a joint site selection team, led by the preparatory office of the First Tractor Manufacturing Factory, began intense site inspections. The team first conducted a survey in the Xigong area, reasoning that if the factory were located there, it could take advantage of the existing infrastructure and facilitate future connections with the old city of Luoyang. However, this location was opposed by both the Air Force and the Ministry of Culture. The Xigong area had an airport built during the Republic of China era, and the airspace over Luoyang was considered favorable, which led the military to believe that Luoyang should be developed into a first-class airport, thus rejecting the Xigong site selection. (Yu, 2009, p.10) Despite negotiations by the preparatory office of the First Tractor Factory, which led the military to agree to the decision to build the factory there, further progress was halted by opposition from the Ministry of Culture. The Xigong area was the location of the capital city of the Eastern Zhou Dynasty, and for the sake of protecting the historical relics, the Ministry of Culture also deemed the area unsuitable for building a factory. The Ministry of Culture's Director, Zheng Zhenduo, stated,

“It won't work if you want to build the factory on the east side of the Jian River in Luoyang. Guo Lao (Guo Moruo) wouldn't agree either because underground, there are remains of the Zhou Dynasty capital, which are priceless treasures (Yang, Yang & Zhong, 2006, pp.30-33).”

After the Xigong site was rejected, the site selection team expanded their search to a larger area. From September to November 1953, the preparatory office focused on investigating the Sanguanmiao, Rantun, and the triangular area between the Jinghan and Longhai railway (composed of the original Luoyang-Kaifeng Railway and Luoyang-Tongguan Railway, along with their extensions), as well as the area west of the Jialu River in Zhengzhou. They also conducted surveys south of the Luo River, west of the Jian River, and in the Baima Temple areas of Luoyang. Meanwhile, they assessed Yanshi, Xin'an, and Shanzhou as potential sites. However, Yanshi, Xin'an, and Shanzhou were deemed unsuitable due to narrow land areas and poor urban conditions. The Baima Temple area east of the old city of Luoyang had too many ancient tombs, making it unsuitable for the factory. The

area south of the Luo River was too far from the railway, requiring the construction of a large bridge over the river, leading to high initial investments. Only the Jianxi area was considered relatively ideal, but it was quite far from the old city and Xigong (Yituo changzhi bianzhu weiyuanhui, n.d.). (Figure 4-2).

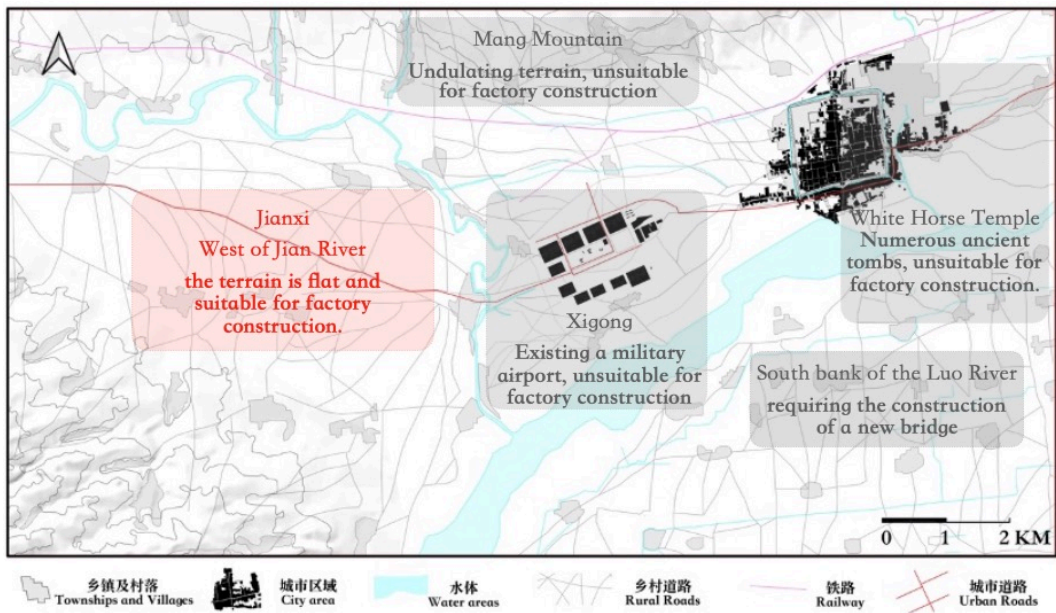


Fig.4-2 Schematic diagram of the site selection for industrial enterprises in Luoyang during the early period of the PRC

Based on these factors, Soviet experts believed Zhengzhou was the most suitable location²⁰. On one hand, Zhengzhou was the intersection of the Longhai and Beijing-Hankou railroads, making transportation convenient for supplying production materials. Additionally, Zhengzhou’s urban planning had already been established, making factory construction more feasible. Under these circumstances, the preparatory office for the First Tractor Factory, following the Soviet experts’ suggestion, decided to build the factory in Zhengzhou. Li Fuchun, then Deputy Director of the State Planning Commission, reported the dilemma of choosing between Zhengzhou and Luoyang to Chairman Mao Zedong. Mao humorously remarked, “Emperors of many dynasties lived in Luoyang, so how could there not be enough space for a tractor factory? (Chen, 2009)” Ultimately, the preparatory

²⁰ Another version suggests that Soviet experts supported building the factory in Zhengzhou, while Chinese experts advocated for building it in Luoyang, as Luoyang is surrounded by mountains on all sides, offering a better strategic position.

office relocated back to Luoyang, and the decision was made to build the factory west of the Jian River, far from the old city.

On November 17, 1953, following instructions from the central government, efforts were concentrated on building the factory west of the Jian River, away from the old city. In December, Li Fuchun and Soviet experts visited Luoyang to assess the conditions for construction. On January 8, 1954, the joint site selection plan for Luoyang was approved by the State Planning Commission and received Mao Zedong's endorsement, confirming the construction of a tractor manufacturing factory, a ball bearing factory, a mining machinery factory, a copper processing factory, and a thermal power station in Luoyang. In June 1954, the Ministry of Construction convened the first national city planning conference, officially designating Luoyang as "a new industrial city with significant industrial construction" and including it among the eight key cities for priority development.

4.1.3 The birth of the Luoyang model

The socialist industrialization mission brought new requirements to the urban development of Luoyang. Looking back at the history from the late Qing Dynasty to the Republic of China, Luoyang had never undergone industrialization, especially the development of heavy industry. Therefore, the construction of a new industrial zone was a pioneering challenge for both Luoyang and the country. Before Luoyang was designated as a "key city," in September 1953, the Ministry of Construction's Urban Planning Bureau established a Luoyang city planning group led by Liu Xuehai, consisting of six members. They began to collect data and survey the terrain in preparation for Luoyang's planning work (Li, 2016, pp.507-508). After the selection of the First Tractor Factory and other industrial enterprises' sites was finalized, in March 1954, the Luoyang city planning group started to compile various types of data. In April of the same year, experts such as Cheng Shifu from Shanghai, Tianjin, and other places joined the Luoyang city planning group. With the support of the Urban Planning Bureau of the Ministry of Construction and under the guidance of Soviet experts, the urban planning work in Luoyang was further promoted.

Early city planning work centered around the new industrial area west of the Jian River. In October 1954, the "General Plan for Luoyang's Jianxi District" was completed. On December 17 of the same year, the State Construction Commission issued the "Review Opinions on the Preliminary Plan of Luoyang's Jianxi Industrial Zone," agreeing in principle to use the general plan as the basis for the current

factory-related projects and the construction of the first phase of the residential area. The city-wide planning for the entire Luoyang area was not completed and approved until 1956, after which the regions of Xigong and the old city gradually integrated with Jianxi, forming the modern spatial structure of Luoyang. This historical fact reflects the reuse of the “building a new urban area near the old part of the city” method during the industrial city construction process in the early years of the People’s Republic of China.

In contemporary studies of Chinese planning history, Luoyang’s method of leaving the old city to build a new district, rolling out the development of both new and old districts, and forming a complete city, is highly regarded by domestic and foreign urban planning experts and scholars. It is praised as the “Luoyang Model” and included in Chinese urban planning textbooks (Li, 2016, p.509). In “Contemporary Urban Construction in Luoyang” organized by the Luoyang Municipal Government, the “Luoyang Model” is summarized by three characteristics:

First, the Luoyang Model adopted the method of building a new industrial zone in the Jianxi District, 8 kilometers away from the old city, and gradually connecting the new and old districts into a complete city, instead of using a radial pattern centered on the old city. To avoid forming two separate cities, the Xigong District was developed as the city center, organically linking the new district with the old district...

Second, the Luoyang Model unified the planning for production and living spaces, separating the factory areas from the residential areas. A protective green belt, 5,600 meters long and 200 meters wide, was planned between the two. Residential areas were located close to the factories to facilitate workers’ commutes. Public and welfare facilities were constructed in the district center and within neighborhoods, making daily life convenient for residents, reducing the volume of public transportation, and ensuring a safe and high-quality living environment. This demonstrated the advantages of socialist urban planning...

Third, the Luoyang Model utilized the geographical conditions of Luoyang, with the Mang Mountains to the north, the Luo River to the south, and the Longhai Railway running east-

west. The production, residential, warehouse, and cultural education and research areas were laid out along the mountains and rivers, with the railway as a boundary, from east to west and north to south. This arrangement cleverly made use of the natural terrain, rationally divided functions, saved construction investment, reduced operating costs, and improved economic efficiency...(Dangdai luoyang chengshi jianshe, 1990, pp.64-66)

From the moment the factory site was determined to be west of the Jian River, it was perhaps already decided that the “building a new urban area near the old part of the city” method, used during the construction of the Xigong military camp, would be employed again in the planning and construction of the industrial area. By establishing the new Jianxi Industrial Zone, the problems of land restrictions and potential cultural heritage protection were solved, and an appropriate distance was left for future integration between the new and old city areas. (In the first characteristic mentioned above, the distance of 8 kilometers between Jianxi and the old city refers to the distance between the centers of the two, while the actual distance from the eastern edge of Jianxi to the western edge of the old city is just over 4 kilometers, with the Xigong area existing in between—the area established as the future city center in the city’s planning).

However, unlike the “building a new urban area near the old part of the city” method used during the Republic of China, the goal of Luoyang’s planning and construction at this time was to create a modern industrial city, not an expansion driven by a single function. The Luoyang Model, with its separation of production and living areas and rational functional zoning, reflected the intrinsic requirements of a modern industrial city. Features such as the protective green belt, 5,600 meters long and 200 meters wide, between the industrial and residential areas, and the layout of the production, residential, warehouse, and cultural education areas from east to west, along the mountains, rivers, and railway, were all realized under the modern socialist industrial city planning concepts, particularly the linear city model. These features became distinctive characteristics of the urban form of Jianxi.

4.2 Causes and characteristics of the urban form of the Jianxi

4.2.1 Factors forming the urban form of the Jianxi

4.2.1.1 Soviet discussion on socialist urban form

Since its establishment in the early 1920s, the Soviet Union has heralded a completely new social structure. In the context of a belief in equality, the Soviet Union fostered a social atmosphere that was vastly different from that of the West, even garnering praise from European architects for its socialist ideals. Before the 1930s, the Soviet Union saw a flourishing of debates on urban, residential, and architectural matters, where European avant-garde architects such as Ernst May and Le Corbusier were actively involved, alongside local Soviet avant-garde architects — all united under the lofty ideals of socialism.

In practical terms, the Soviet Union indeed became a laboratory for various architectural ideas and theories. Whether realized through actual constructions or presented as speculative concepts, the results were often striking. Behind these endeavors, architects were tasked with creating urban planning, living environments, and architectural forms that diverged from the capitalist world. Regarding the question of socialist cities, Marx had clearly stated in his *Manifesto of the Communist Party*: “The differences between town and country will gradually disappear as agriculture and manufacturing become combined.” Engels, in his work *The Housing Question*, further elaborated:

“Trying to solve the housing question by maintaining our large cities is pointless... Only by distributing the population evenly across the country and integrating industry with agriculture, coupled with the abolition of capitalist production, can we rescue the countryside from the condition of isolation and demoralization. (Miliutin, 1975, p.60)”

Lenin, the leader of the Russian Revolution, also commented on urban matters:

“We must aim for the integration of industry and agriculture, using scientific principles to combine collective labor and end the isolation, demoralization, and remoteness of villages, as well as the unnatural concentration of large populations in cities. (Miliutin, 1975, pp.62-63)”

These ideas undeniably called for a new urban form that adhered to socialist ideals, one that aimed to bridge the gap between cities and the countryside. Based on these thoughts, two distinct schools of thought emerged among Soviet architects: Urbanism and Disurbanism. Both schools were grounded in Marxist theory and followed Lenin's vision for socialist cities. While both shared utopian imaginations for a socialist city, their approaches to urban form were starkly different.

Specifically, during the 1920s, urbanists aspired to build grand cities. They admired industrial cities like Chicago, which had sprung up from nothing, and viewed skyscraper-filled metropolises as symbols of power (Hatherley, 2020, pp.63-64). However, by the late 1920s, avant-garde architects began rethinking urban-rural relations, leading to a shift in urban planning concepts.

On the one hand, Urbanists, represented by Leonid Sabsovich and the Vesnin brothers, believed in the central role of cities in socialism. They opposed the unchecked expansion of existing cities and advocated for the construction of satellite towns around large cities, resembling the idea of a "Garden City." They also championed collective living, arguing that abolishing private property should lead to a promotion of collectivism, with communal living replacing individual family life. In the realm of housing, they saw homes merely as places for rest, with all other activities intended to be carried out in public spaces. Ginzburg's design for the Narkomfin Building is an embodiment of this urbanist vision²¹.

On the other hand, the Disurbanists, represented by sociologist Mikhail Okhitovich²² and architect Ginzburg (who had transitioned from urbanism to disurbanism under Okhitovich's persuasion) (Lucarelli, 2012), espoused a more decentralized vision of the city. They sought to achieve Marx's goal of eliminating

²¹ Moisei Ginzburg, a Soviet constructivist architect, translated Le Corbusier's works and was influenced by his ideas on architectural design. Ginzburg later joined the "disurbanism" camp initiated by Mikhail Okhitovich. Le Corbusier even wrote to Ginzburg, expressing his regret over Ginzburg's abandonment of urbanist ideas. The Narkomfin Building, designed by Moisei Ginzburg, was influenced by Le Corbusier's Unité d'Habitation. However, unlike the Marseille Housing, the Narkomfin Building was not oriented toward family life but was instead designed to promote a collective way of living.

²² Mikhail Okhitovich was an important figure in the Soviet architectural field during the 1920s and 1930s. He was a Bolshevik sociologist, urban planner, and theorist of constructivist architecture, as well as a member of the Soviet architects' union OSA (Organization of Contemporary Architecture). As a supporter of Leon Trotsky's Left Opposition, Okhitovich clashed with the authorities during Stalin's leadership. After criticizing the cult of personality, he was politically condemned, first for his intellectual and architectural work, particularly for his "disurbanism" theory, which was accused of being economically flawed. He was later arrested, sent to the Gulag, and ultimately executed in 1937.

the urban-rural divide by dismantling large cities and urban centers (Hatherley, 2020, p.64). Disurbanists believed that “workers want the suburbs, with personal automobiles as their commuting tools. (Hatherley, 2020, p.67-70)” Their vision involved providing scattered housing for individuals, interconnected by transportation, energy, and communication networks. They even conceived of mobile homes, creating a dispersed, homogeneous space without traditional urban boundaries — an endless urban landscape interspersed with industrial zones and collective farms.

Beyond these two competing schools of thought, Nikolay Alexandrovich Miliutin’s vision of a “Linear City” represented a middle ground, combining elements of both Urbanism and Disurbanism. Miliutin, a man with multiple roles — working in the Soviet Economic Council, engaging in urban planning, and later studying architecture — proposed a holistic vision of cities and architecture²³. His thoughts were consolidated in his book *Sotsgorod: The Problems of Building Socialist Cities*. In the third chapter of this book, Miliutin critiques the debates between Urbanists and Disurbanists, arguing that their disagreements were unnecessary. He posited that once capitalist industrial concentration was abolished, a new urban organization model would naturally emerge, resolving the conflicts between urban centralism and decentralism. Furthermore, Miliutin advocated for stronger connections between cities and the countryside, echoing Engels’ call to liberate rural areas from isolation (Miliutin, 1975, p.60).

Building on the work of Western predecessors, Miliutin clarified his concept of Linear City, which he saw as the ideal form for socialist industrial cities. This vision would go on to be recognized by future scholars as his unique contribution.

4.2.1.2 Clarification of the linear city concept

The idea of Linear City can be traced back to the late 19th century when Spanish architect Arturo Soria y Mata proposed a linear city plan (Figure4-3). The goal was to alleviate urban congestion by dispersing part of the urban population into underdeveloped rural areas, linked by rail, thereby improving living conditions and mitigating class tensions (Liu, 2020, pp.109-118). Later on, architects in Europe

²³ Miliutin, a Russia trade union, Bolshevik activist and urban planner, participated in the October Revolution in Petrograd. Later, he served at the Ministry of Finance of the Soviet Union as the People’s Commissar for Finance of the RSFSR. He was also involved in Soviet urban planning. However, Milyutin is remembered and regarded as a planner and architect primarily for his concept of the *Sotsgorod* (socialist city).

and South America further explored the concept of linear cities, enriching its theoretical foundation. For instance, French architect Tony Garnier envisioned zones arranged along transportation lines in his industrial city plans (“Tony Garnier from An Industrial City”, 2016) (Figure 4-4).

Unlike previous explorations of linear cities, Miliutin, drawing on socialist ideology, explicitly defined the distribution of functional zones within the city and the relationship between residential areas and transportation axes. His work provided clearer and more concrete explanations for the planning model of linear cities, gaining recognition from the Soviet government and attracting the attention of Western urban planners and architects, including Le Corbusier (Miliutin, 1975, p.2). Miliutin’s concept of the linear city became a classic case of linear city planning. (Liu, 2015, pp.116)

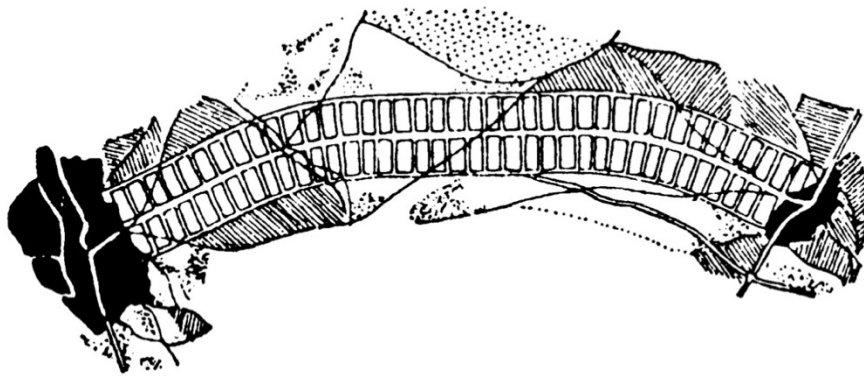


Fig. 4-3 The linear city conceived by Spanish architect Soria. (Source: Sotsgorod)

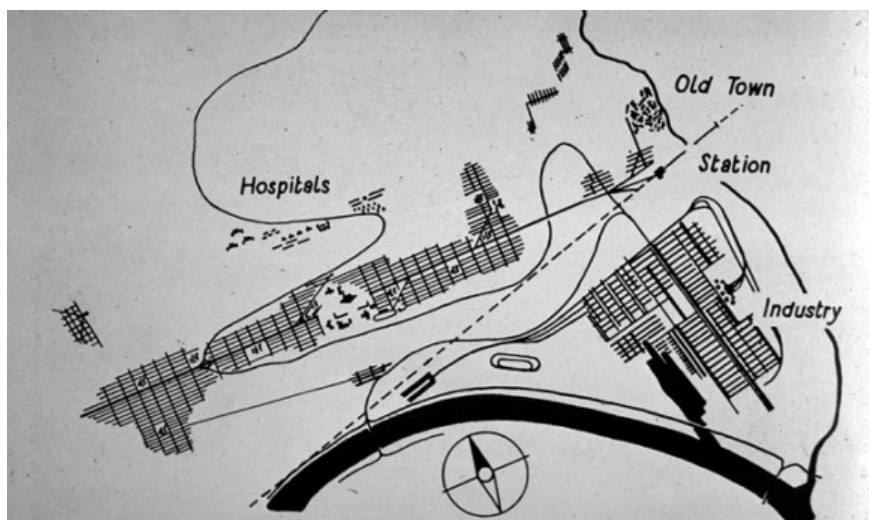


Fig. 4-4 The linear industrial city conceived by French engineer Garnier. (Source: <https://senacatal.wordpress.com/2016/03/06/tony-garnier-from-an-industrial-city/>)

Miliutin laid out a specific sequence for the functional zones in a linear city (see Figure 4-5, left):

(1) Railway area (2) Production and public enterprises, warehouses, stations, and relevant scientific, technical, and educational institutions (3) Green belts and primary highway areas (4) Residential areas (organized into sub-zones): a) Social institutions (cafeterias, pharmacies, council meeting centers, etc.); b) Housing; c) Childcare facilities (nurseries, kindergartens, dormitories, etc.) (5) Parks and recreational facilities (such as sports fields and swimming pools) (6) Gardens and state farms (irrigated fields, farms, and similar agricultural enterprises) (Miliutin, 1975, p.66)

Miliutin emphasized that altering this sequence of zones would be illogical, as it would disrupt the city's overall structure and negatively impact urban development — leading to unhealthy living environments and undermining the benefits of a functional assembly-line system. When arranging the city's functional zones, he recommended factoring in water bodies and wind directions, as these directly affect living conditions (Miliutin, 1975, p.66). Furthermore, Miliutin suggested that linear city layouts weren't just for flat terrains; sometimes, using sloped land could create more effective landscapes, evoking the amphitheaters of ancient Rome, enhancing urban aesthetics (Miliutin, 1975, p.66).

Beyond urban-level considerations, Miliutin extended his linear city ideas to the layout of industrial enterprises, proposing that a continuous flow of production areas could enhance efficiency while reducing construction costs. In housing and residential planning, Miliutin introduced the concept of living cells — Existenzminimum (The dwelling for minimal existence), while ensuring economic viability, provided basic living needs and improved residents' efficiency.

In summary, Miliutin's linear city concept rested on a layered relationship between individuals, factories, cities, and the state, with each level striving for maximum efficiency through spatial design. The production enterprise formed the core of the linear industrial city, where the rational layout of production zones and the comprehensive facilities for workers' living areas ensured high productivity. Other urban functions, such as research institutions and educational centers, were designed to serve the industrial needs of the city. Farms provided food for residents, and the entire city followed a systematic layout resembling an assembly line. At a national level, cities were interconnected by railways and highways, creating a

network of industrial nodes, allowing the entire country to operate efficiently. This, in essence, responded to the Soviet imagination of industrial development.

After 1930, under Stalin’s rule, Soviet architecture took a sharp turn toward neoclassical designs, with grand, new Haussmann-style city planning becoming the norm. This shift suppressed the modernist experiments in architecture and urban planning that had flourished in the 1920s, marking them as ideologically opposed. Despite this shift, Miliutin’s vision of socialist industrial cities did not completely disappear — echoes of it could still be seen in the Soviet industrial towns built during the 1950s, demonstrating the enduring influence of his ideas.

4.2.2 Characteristics of Jianxi’s urban form

4.2.2.1 Functional zoning based on the ideal industrial city

Compared to the old city and Xigong, the modern industrial urban form of the newly planned Jianxi area stands out. It not only reflects a pursuit of efficiency but also aligns with the Soviet vision for the socialist industrial city. In terms of spatial layout, the Jianxi Industrial Zone shows a high degree of similarity with Miliutin’s concept of the “linear city.”

The Jianxi Industrial Zone, from north to south, is arranged in the following order: railway lines, industrial production areas, green buffer zones, urban main roads, residential areas, research institutes, and higher education institutions (Figure

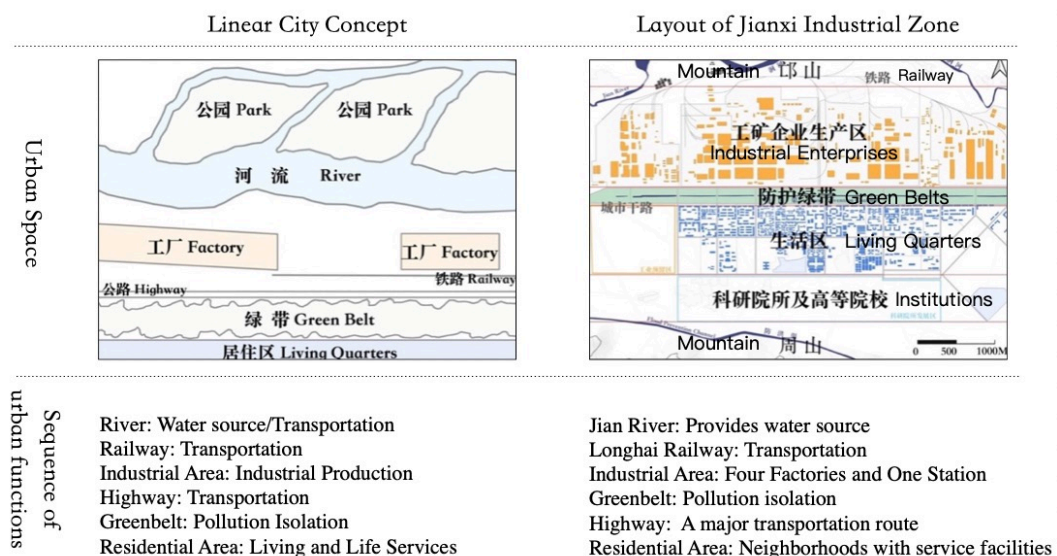


Fig. 4-5 A comparison between a schematic of a linear city from the book *Sotsgorod* by Miliutin (left) and the linear city structure of the Jianxi Industrial Zone in Luoyang (right).

4-5, right). This arrangement largely mirrors the spatial sequence in Miliutin's concept of the "linear city."

Within the Jianxi Industrial Zone, the "four factories and one station"²⁴ of the "156 Projects" — namely, the Mining Machinery Factory, the First Tractor Factory, the Luoyang Bearing Factory, the Copper Processing Factory, and the Luoyang Power Station — were the first to be built starting in 1953. The four mechanical processing factories, except for the power station, were lined up along the city's main road, forming the production space of the Jianxi Industrial Zone. This road, located to the south of the "four factories and one station," connected the old city and the Xigong area and largely followed the direction of the old Luotong Road. As a result, this road not only connected different parts of Luoyang but also served as a key transportation route linking Luoyang with surrounding cities.

To the north of the industrial production space, a railway line crossing the Jian River was built, connecting the factories and the power station to the national east-west railway line — the Longhai Railway. This "south road, north railway" layout aligns with the spatial concept of the "linear city," making raw material and product transportation more convenient.

Between the production area and the urban main road lies a green buffer zone, intended to reduce the impact of industrial pollution on the workers' living areas. However, the residential areas located to the south of the production zone were downwind due to the prevailing northwest winds in Luoyang, which was unfavorable for residents' health. But because the existing railway and roads were located to the north of Jianxi and the urgency of building industrial enterprises, some compromises had to be made in the planning concerning wind direction and urban layout. Hence, a green buffer zone with a width of 200 meters (actually about 170 meters wide, later removed in the 1960s to make way for workers' housing) was set up between the production area and the residential zone. This not only adhered to the "linear city" concept but also reflected the reality in Luoyang — mitigating the impact of unfavorable wind directions on the residential areas.

In the residential area to the south of the green belt and the urban main road, residential districts, referred to as "Jiefang (街坊)," were built to house the workers

²⁴ Four factories and one station: Refers to the four large-scale machinery factories and one thermal power station initially constructed in Luoyang during the First Five-Year Plan period, namely the Luoyang First Tractor Manufacturing Factory, Luoyang Bearing Factory, Mining Machinery Factory, Copper Processing Factory, and Luoyang Thermal Power Station.

of the industrial enterprises. These neighborhoods were equipped with basic amenities needed for the daily lives of workers, including parks and commercial facilities.

Unlike Miliutin's plan, the residential zone in the Jianxi Industrial Zone was not bordered by farms but rather by research institutes and higher education institutions, which mainly served the corresponding industrial enterprises. For example, the Tractor Research Institute and Luoyang Agricultural Machinery College (now Henan University of Science and Technology) served the First Tractor Factory, the Non-ferrous Metals Research Institute supported the Copper Processing Factory, and the Bearing Research Institute catered to the Bearing Factory. To the south of the research and education zones stood Zhoushan, with villages and farmland on the mountain.

This analysis highlights the similarities between the Jianxi Industrial Zone and Miliutin's linear city planning concept. Moreover, the east-west railway and main road configuration suggests that the industrial city form of Jianxi had the potential for expansion to the east and west.



Fig. 4-6 The status map of Jianxi industrial Zone in late1950s

By 1957, when the first Five-Year Plan was completed, most of the first phase of the Jianxi Industrial Zone — including four major machinery factories — had been built, with 20 out of 28 large factories completed and 27 out of 65 workshops put into production. Under the linear city planning concept, the spatial organization and urban fabric of Jianxi had already diverged from those of the old city and Xigong, reflecting the spatial manifestation of socialist industrial development in Luoyang (Figure 4-6).

4.2.2.2 Influencing factors of the industrial urban form in Jianxi

While the overall layout of the Jianxi Industrial Zone aligns with the ideal form of a socialist industrial city, specific adjustments were made based on the local context of Luoyang and the historical background at the time. These adjustments can be discussed from two perspectives: topography and urban design.

From a topographical perspective, although the Jianxi Industrial Zone was located on relatively flat land, it still lay between Mang Mountain to the north and Zhou Mountain to the south. The area south of Mang Mountain was occupied by the Longhai Railway, restricting the city's development to the flat space between the Longhai Railway and Zhou Mountain. Therefore, the functional zoning of the linear city in Jianxi could only be laid out from north to south, which contributed to the aforementioned issue of unfavorable wind directions.

The presence of slopes to both the north and south limited the width of the Jianxi Industrial Zone, meaning that it could only expand along an east-west axis, with flood channels and rivers forming natural boundaries. To the north, the Jian River served as a barrier to prevent flooding from Mang Mountain, while the research institutes and their associated residential areas to the south were bordered by a flood channel excavated along the base of Zhou Mountain. To further protect the industrial production zone, a second flood channel was dug in the green belt south of the production area, forming a double barrier with the flood channel at the base of Zhou Mountain.

In the east-west direction, administrative boundaries also limited the expansion of the Jianxi Industrial Zone. To the west, it bordered Xin'an County, while its eastern boundary was marked by the Jian River, with Xigong on the other side. Consequently, the linear city form of Jianxi was confined within these geographical boundaries, with initial construction work focused on this area, dictating the general direction of the city's development.

From an urban design perspective, Luoyang combined modern urban planning with the aesthetics of Stalinist cities in the Soviet Union, focusing on city axes, key urban spaces, and the treatment of street interfaces. Miliutin's concept of the linear city did not propose a specific method for city design. However, based on his ideas for production and residential spaces, his urban thoughts were more aligned with modernism. After 1930, when Stalin called for socialist realism in architecture, the experimental ideas of various architectural groups in the Soviet Union were halted. A new Stalinist city planning approach — characterized by new Haussmann-style city planning with axial layouts and uniform street facades featuring neoclassical elements — became the norm, with the city planning of Moscow serving as its most iconic representation.

In the early 1950s, this Stalinist city design philosophy was introduced to China under the “leaning to one side” policy, having a direct influence on urban planning and architectural design in the country. Therefore, discussions on the origins of China's urban planning in the early years of the PRC often center around Moscow's planning model. In fact, early Chinese city planning often combined the layout of modern industrial cities with the aesthetic forms of Stalinist cities.

The Jianxi Industrial Zone serves as a typical example of this combination of modernist planning ideas with the Stalinist city form. As a result, the spatial organization of the Jianxi Industrial Zone not only followed the logic of modern industrial cities but also incorporated city axes, monumental buildings, and residences featuring Chinese traditional architectural elements. This created a blend of modern urban thought with Chinese and Western classical decorative arts.

In the planning map of the Jianxi Industrial Zone, attention was given to the treatment of urban nodes, such as radial roads and squares surrounded by prominent buildings, which served as decorative elements in the urban landscape (Figure 4-7). Another aspect of Stalinist urban planning that influenced Jianxi was the treatment of street facades. The early housing blocks in Jianxi adopted a “Kvartal” form with perimeter layouts that effectively concealed the gable ends of buildings, maintaining a continuous and complete street interface in line with the new-Haussmannian style urban design principles of Stalinist cities. As Léon Hoa mentioned in *Rebuilding China – 30 Years of Urban Planning (1949-1979)* regarding Soviet experts' requirements for urban design:

“Soviet advisers demanded not only uniformity along the main streets but also along the secondary roads. To achieve this

effect, they believed that new residential buildings should be lined up along the streets, following the architectural styles of old European cities and concessions. (Hua & Li, 2006, p.54)”

In summary, under the second “building a new urban area near the old part of the city” strategy implemented after the founding of the PRC, the Jianxi Industrial Zone was built based on the ideal form of the “linear city.” This plan combined the city aesthetics promoted by the Soviet Union at the time with Chinese traditional architectural decoration, balancing the modern city form with the requirements of the historical context. Adjustments were also made to suit the actual conditions in Luoyang, creating a unique industrial urban form that symbolized Luoyang’s transformation from a pre-modern agricultural city into a modern industrial city.



Fig. 4-7 The urban spatial art design in the city planning of the Jianxi industrial district

4.3 Analysis of the elements of the urban form of the Jianxi

4.3.1 Dominant influence of modern industrial buildings

4.3.1.1 Large-scale industrial enterprises supported by the Soviet Union

The Soviet model prioritized the development of heavy industry, which meant that urban planning had to serve social production (Smith, 1996, pp.71-72). In the early years of the People’s Republic of China, under the policy of “learning from the Soviet Union (以苏为师),” urban planning and architectural design in China were characterized by a strong emphasis on “building for production.” The planning and construction of the Jianxi Industrial Zone exemplify this approach.

In the Jianxi Industrial Zone, the process was reversed from the norm: instead of urban planning dictating industrial site selection, the factories were established first, and urban planning followed. Typically, urban planning precedes the siting of industrial enterprises to ensure they comply with the city's development strategy. This reversal highlights the urgency of industrial development, reflecting the reality of China's weak industrial base and the complex international situation at the time. Consequently, quickly establishing the basic framework of China's industrial system by drawing on Soviet experience became a critical goal.

Centered around the initial construction of the “four factories and one station” — namely the Mining Machinery plant, the First Tractor Factory, the Luoyang Bearing Factory, the Copper Processing Factory, and the Luoyang Power Station — the Jianxi Industrial Zone was planned using the functional zoning approach typical of the “linear city” model. The industrial production area covered a vast area, creating a stark contrast with the residential zones and emphasizing the industrial urban form of Jianxi (Figure 4-8).

The internal spatial organization of these industrial enterprises followed the logic of modern production, aiming for high efficiency. The design of the factories



Fig. 4-8 The production area of the “Four Enterprises and One Power Station,” built during the first phase of construction in the Jianxi Industrial Area, occupied the majority of the urban space

was a collaborative effort between Soviet and Chinese design teams. The Soviets were responsible for the process flow and design of key production workshops, provided core equipment, and transferred relevant technology. Chinese design units were responsible for auxiliary workshops and external infrastructure, such as dormitories and residential areas (Sun, 2016, pp.156-158).

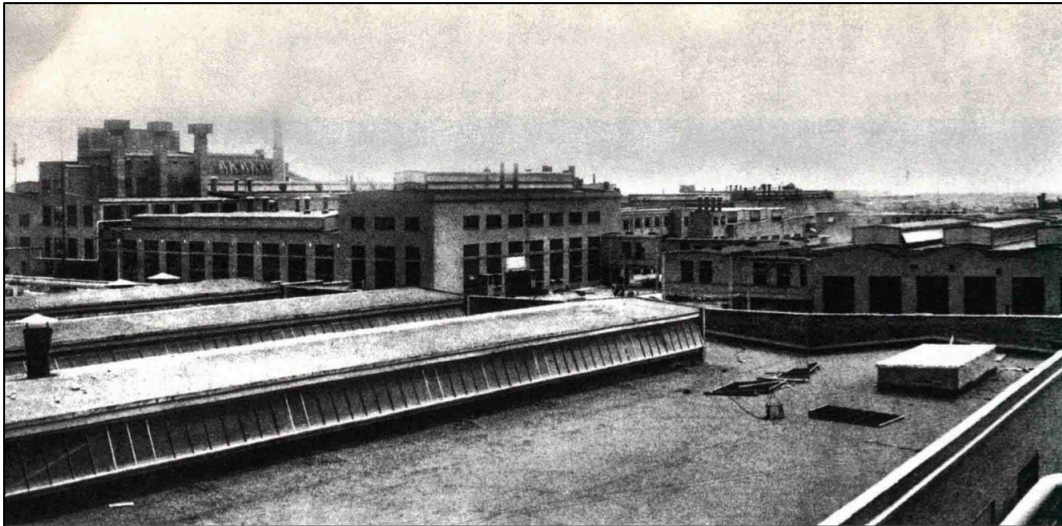


Fig. 4-9 A Glimpse of Luoyang No.1 Tractor Factory

For example, the First Tractor Manufacturing Factory in Jianxi, the largest in the zone (Figure 4-9), occupied an area of 1.45 million square meters, with a production area of 329,500 square meters. Its design and construction were modeled after the Kharkiv Tractor Plant (KhTZ) in Ukraine, which was the largest tractor factory in the Soviet Union. The Soviet Automobile and Tractor Design Institute handled the preliminary and technical design, while the Kharkiv Tractor Plant managed the entire process design and provided blueprints for the DT-54 tractor. The Kharkiv Agricultural Machinery Design Institute took charge of the expanded preliminary design and construction of key workshops, while 15 domestic design units were involved in other project designs (“Diyi tuolaji zhizaochang, n.d.”).

Similarly, the entire preliminary and technical design for the Luoyang Mining Machinery Factory was completed by Soviet specialists, with the Ukrainian Coal Mine Design Institute overseeing the design of the main production workshops, such as the first metalworking and assembly workshop, the auxiliary workshop, and the cutting and drop forging workshops (Shi, 2021, p.19). The design of the Luoyang Bearing Factory was also expanded under the guidance of Soviet experts (Sun, 2016, p.77).

It is worth noting that when discussing Soviet assistance, we often overlook the origins of the technologies provided by the Soviet Union. In fact, before World War II, the Soviet Union was not entirely isolated from the West. There was significant cooperation between the Soviet Union and Western countries in fields such as industrial technology. For instance, the Kharkiv Tractor Plant in Ukraine, mentioned earlier, was designed by American architect Albert Kahn, who was hired by the Soviet government to participate in numerous industrial design projects. Kahn helped the Soviet Union establish its standardized industrial system (Crawford,2018). This small case reflects the fact that, through Soviet technical assistance, China was introduced to a globalized technical system in the early days of the PRC. Concepts and methods like Fordism and Taylorism, which had been adapted by the Soviet Union, were also introduced to China (Wu & Yu, 2024, pp.1-20), playing a crucial role in the country's industrial development.

4.3.1.2 Production processes determine factory layout

For the industrial enterprises that played a key role in shaping the urban form of Jianxi, their spatial organization was dictated by the production process, clearly embodying the utilitarian value of “form follows function.” The production zones of industrial enterprises are fundamental elements of social production and are at the lowest level in the overall hierarchy of urban planning. The pursuit of efficiency, reflected in the “assembly line” style of spatial structure, originated in factories and is most clearly manifested there.

Using the First Tractor Manufacturing Factory as an example (Figure 4-10), the entire production zone can be divided into five modules arranged from north to south, roughly corresponding to power, casting, assembly, and stamping modules. The power module was the power plant, supplying electricity, steam, gas, oxygen, and compressed air to various workshops. The casting module included three foundries for iron, non-ferrous metals, and forging, producing the various components needed for tractors. The southernmost module was the stamping workshop, where the engine casings and cabins were manufactured. Between the casting and stamping modules were two engine workshops and assembly lines, where all components were assembled, before being sent to the tractor storage yard. Surrounding these main workshops were various auxiliary workshops and warehouses, such as model-making factories. Once the railway branch line entered the plant, additional tracks branched off to facilitate material transport to different workshops and the shipment of finished products. The “assembly line” design

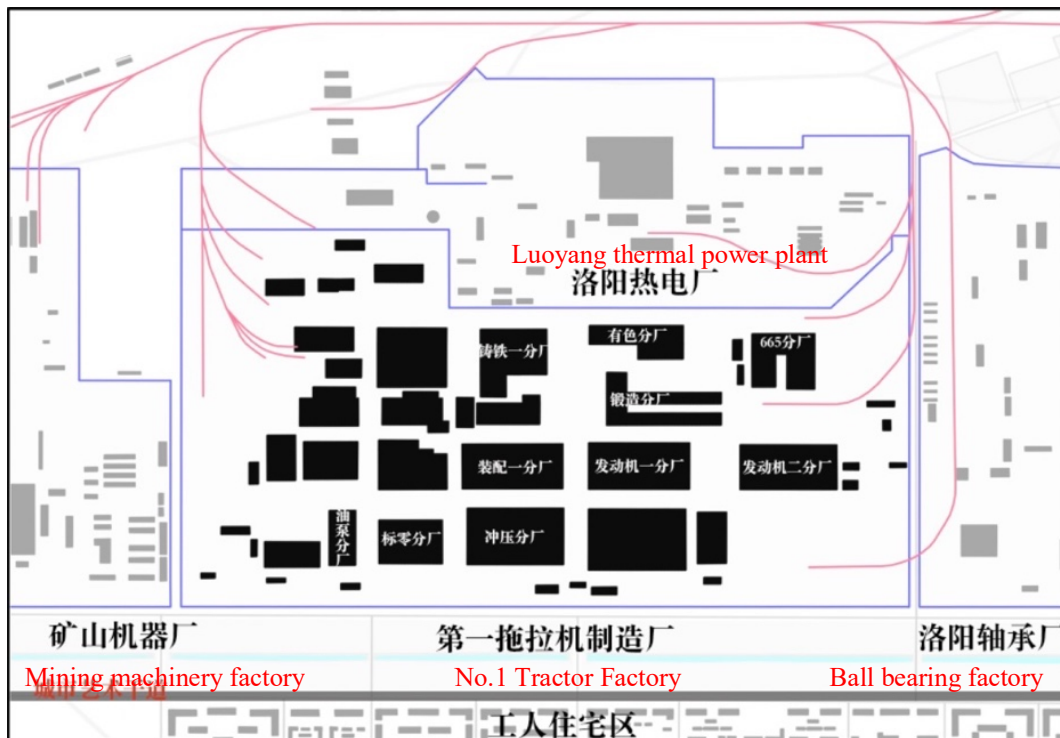


Fig. 4-10 The Production Space Layout of Luoyang No.1 Tractor Factory

determined the logic of the spatial organization of the production zone, which, in turn, shaped the layout of the factory.

4.3.2 Emergence of new residential forms and communities

With the development of modern industrial cities, the residential modes in the Jianxi Industrial Zone also underwent changes, reshaping the urban landscape (Figure 4-11). The following discussion will cover both residential buildings and residential districts.

4.3.2.1 The construction sequence: dormitory first, housing later

To ensure the basic living needs of workers, the construction of living quarters in the Jianxi Industrial Zone was carried out almost simultaneously with the building of the industrial plants. Given the urgency of the project, the residential areas followed a “dormitory first, housing later” construction approach (Sun,2016). The main types of housing built during this period were single dormitories and apartment-style residences. Although similar in appearance—both being 3 to 4-story brick buildings with large roof structures and traditional Chinese decorative elements to reflect “national style (民族形式)”—the two housing types differed in



Fig. 4-11 The living quarters for enterprises in the first phase of the Jianxi Industrial District clearly differ in form from the traditional courtyard-style houses in the old city

their layouts. The former catered to single young workers, while the latter provided housing for leadership personnel and workers with families, with layouts designed for nuclear families (Figure 4-12).

The new-style residences in Jianxi Industrial Zone were suited to the efficiency demands of a modern industrial society. The single dormitories served unmarried youth, simplifying their living environments to the extreme. These young workers labored in factories, ate in canteens, and spent their leisure time in worker clubs,

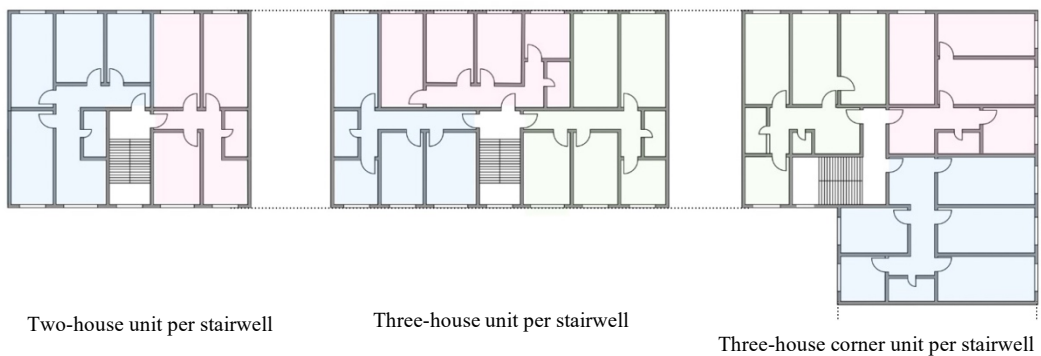


Fig. 4-12 The plan of apartment in Jianxi industrial Zone

evoking the Soviet Union’s 1920s concept of the “social condenser,” where housing was reduced to spaces for rest, pushing individuals toward a collective lifestyle.

The apartment-style housing, designed for nuclear families in the industrial era, had a far-reaching impact on living arrangements in Jianxi and beyond, symbolizing the transformation of residential patterns and social life in the industrial age.

The housing forms were matched with a modern urban unit known as the “dajiefang” (kvartal) (Figure 4-13). In the Soviet Union, kvartal emerged to complement “Stalinist cities,” intended to counter the “neighborhood unit” concept that had gained popularity in the Western world (Tan & Tang, 2021, pp.17-25). From an urban perspective, the large block was one of the key guidelines for controlling urban form and density (Kim, 2017, pp.199-223). In these blocks, the housing primarily adopted a perimeter-style layout with neoclassical design elements, ensuring the continuity and uniformity of the urban facade. This type of block was not only found in the Jianxi Industrial Zone but also promoted in other contemporary Chinese cities, such as the baiwanzhuang residential area in Beijing and the residential areas built for the First Automobile Works in Changchun.

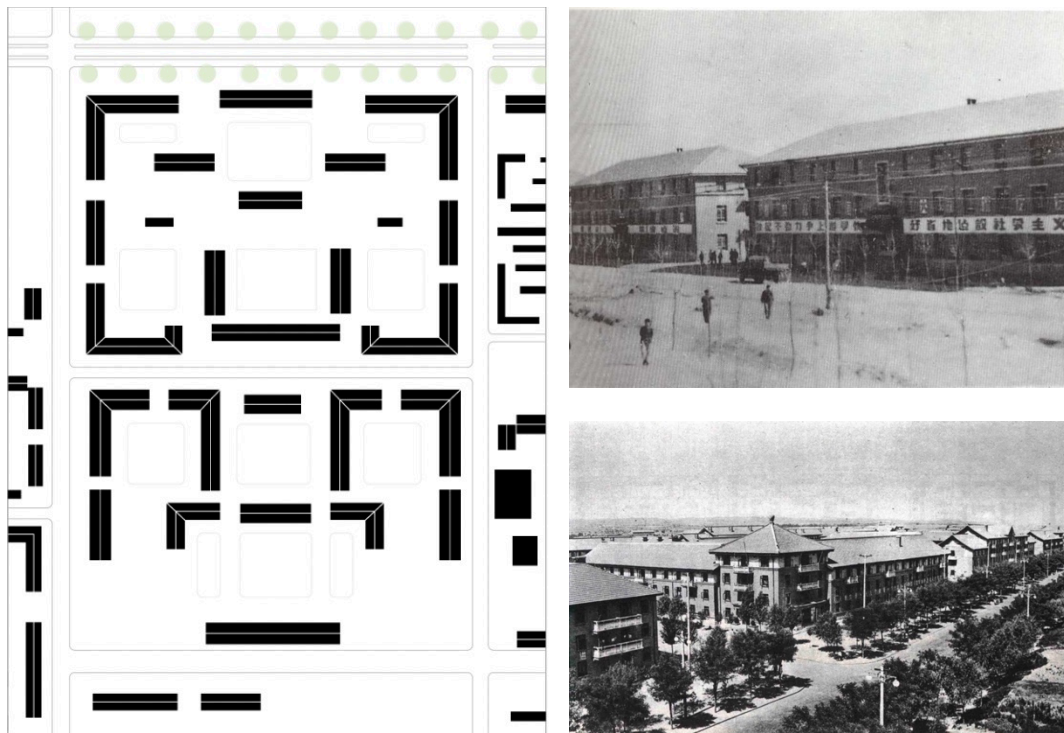


Fig. 4-13 Residential Area Plan and Photos of Jianxi Industrial Zone

4.3.2.2 Transition from “Kvartal” to “Microdistricts”

While kvartal ensured a unified urban landscape, they also had several drawbacks. First, the emphasis on decoration increased construction complexity, reducing cost-efficiency. Second, large dwelling type like three-bedroom or four-bedroom apartments, which were prevalent, did not suit the housing shortage in China at the time. Third, the perimeter layout was not suitable for China’s climate. In 1956, an article in *Architectural Journal* featured a student design from Tsinghua University that criticized the perimeter-style layout of kvartal.

“The perimeter-style layout cannot fully satisfy the principles of practicality, economy, and aesthetic appeal. The buildings along the east-west axis beautify the street facade and make the courtyard space more cohesive, but they impact living conditions. In particular, rooms facing west are uncomfortable during the hot summer, so this block layout fails to show enough consideration for the residents. (Chang, 1956, pp.113-121)”

In response to these issues, China began to rethink the residential blocks built during the early phase of the First Five-Year Plan in the mid-to-late 1950s, ushering in a new form of residential district. Around the same time, the Soviet Union also re-evaluated its own housing construction after Stalin’s death.

“In 1954, during an All-Union meeting of construction workers held at the Kremlin, Comrade Khrushchev exposed the tendency among Soviet architects to pursue excessive decoration and extravagance in buildings—practices that were wrong, impractical, and harmful. He criticized architects for indulging in aesthetic pursuits detached from the needs of the people and the demands of construction. (Sha & Wang, 1956, pp.1-27)”

Faced with the unresolved post-war housing crisis, Stalin’s successor Khrushchev proposed in 1957 to solve the housing problem within ten years, aiming to build fifteen million new homes in cities based on the principle of “one family, one flat”—quickly, economically, and with good quality (Glendinning, 2021, p.299). The microdistrict (also known as the “Xiaoqu”) planning model was born from this initiative and was promoted in the Soviet Union and other socialist countries. It gradually became a distinctive feature of socialist cities (Ndrusz, Harloe & Szelenyi, 2011). Compared to kvartal, microdistricts featured more flexible spatial layouts, simplified decorative elements, smaller apartment units,

and the adoption of standardized designs and prefabrication technologies, greatly improving construction efficiency.

As the Soviet Union shifted towards microdistrict planning, similar changes emerged in China's housing sector. In 1962, Cheng Shifu and others published an article in *Architectural Journal* titled "Discussion on Several Issues of Residential Area Planning," which pointed out:

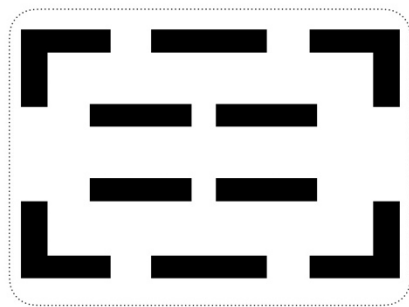
"During the First Five-Year Plan, most residential areas were planned according to kvartal layout. In the Second Five-Year Plan, we learned from Soviet experiences, and many places adopted the microdistrict layout... Both kvartal and microdistricts are forms of layout under socialism, designed to rationally organize people's lives. The difference lies in the size: microdistricts are generally larger and take into greater consideration transportation, welfare facilities, and economic efficiency. (Cheng, Zheng, An & Zhou, 1962, pp.1-3)"

By the late 1950s (during the Second Five-Year Plan), the transition from large blocks to microdistricts became visible in the Jianxi Industrial Zone. Some residential areas built later for mining enterprises and research institutes had already begun to adopt the microdistrict layout. This change coincided with the introduction of Soviet microdistrict planning concepts into China.

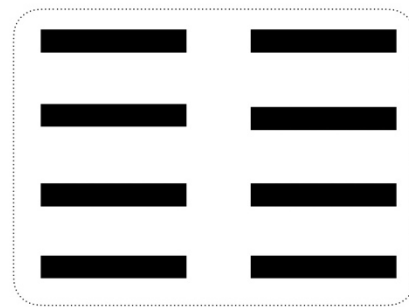
In contrast to large blocks, these new residential areas were arranged in rows, without special treatment for corners, allowing the gable walls of east-west oriented buildings to be exposed. This approach aligned with the microdistrict's free layout, which broke away from the street corridor aesthetic and abandoned the need for continuous street facades. Additionally, the proportion of one- and two-bedroom units increased to accommodate the housing needs of nuclear families. These changes reflected the mass housing movement's focus on rationality, economy, and efficiency. Over time, this new form of residential development came to dominate the Jianxi Industrial Zone and had a lasting impact on the development of Luoyang's residential areas and urban form (Wu & Yu, b. 2024, pp.11-17).

In conclusion, during the early years of the People's Republic of China, under the policy of "learning from the Soviet Union," both the kvartal and microdistrict housing models were implemented in the Jianxi Industrial Zone. The transition from one to the other reflected a shift from an aesthetic focus to one centered on economy and practicality (Figure 4-14). Regardless of their relative advantages and

disadvantages, both models provided Luoyang with a modernized residential system. Their use in the Jianxi Industrial Zone not only helped shape the new form of industrial urban housing but also played a significant role in the transformation of people’s daily lives.



The kvartal adopts a perimeter layout, reducing the exposure of gable walls to maintain a unified urban interface. The Kvartal was predominantly used for housing in the mid-1950s.



The xiaoqu features row-type housing, with a greater focus on functionality. The Xiaoqu gradually became more common in the late 1950s.

Fig. 4-14 The two distinct residential forms, Kvartal and microdistrict.

4.3.3 Diversity of public building type

4.3.3.1 Public buildings as supporting facilities for industrial enterprises

Public services are not only a hallmark of modern cities but also an intrinsic requirement of the welfare system in socialist cities. Public buildings are the carriers through which these services are provided. In the early stages of Jianxi Industrial Zone’s development, in addition to the rapid construction of industrial zones and residential areas, a series of public buildings were established to serve the daily lives of workers. These buildings played a critical role in shaping the public service system in modern Luoyang.

During the early Soviet exploration of socialist cities and settlements, efforts were made to shape a new way of life for workers through public buildings. The concept of the social condenser, introduced in the 1920s, embodied this vision (Han & Kang,2023). Under the social condenser concept, public buildings, along with housing, were seen as responsible for social transformation. During Stalin’s era, public buildings became vital in fostering socialist identity, exemplified by monumental Stalinist architecture, such as the “Seven Sisters” in Moscow. Under Khrushchev, modern architectural forms were embraced, with an emphasis on

rational and economical design in public services, setting clear facility standards based on per capita requirements (Sha & Wang,1956).

In socialist cities, new citizens actively participated in the industrialization process, developing a collective way of life: they dined in public canteens and spent their leisure time in clubs and sports facilities. This utopian vision gave rise to new building types that played a key role in shaping socialist life.

As part of Jianxi’s industrial urban transformation, public buildings underwent significant changes. Planning standards provided guidance for the design of public buildings, such as kindergartens with 12 places per 1,000 people, middle schools with 18 places per 1,000 people, theaters with 9 places per 1,000 people, cultural palaces with 11.4 places per 1,000 people, and post offices with 10-20 square meters per 1,000 people. With a focus on “construction for production” and the demands of modern urban planning, the initial changes in Jianxi were most apparent in areas directly related to workers’ daily lives, such as education, entertainment, dining, and healthcare (Figure 4-15).

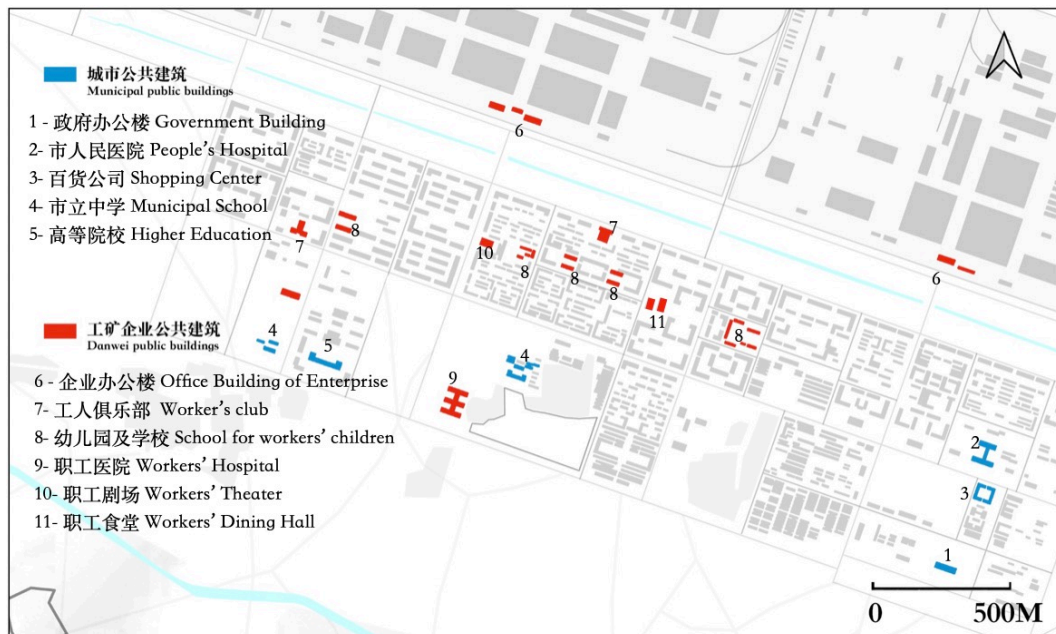


Fig. 4-15 Illustration of public building distribution in Jianxi Industrial Zone, late 1950s

One such building type was the workers’ club, which combined educational and recreational functions. In socialist countries, clubs had a certain propaganda and educational function and were an integral part of daily life (Zhang, 2018, p.23). As early as the 1920s, workers’ clubs and cultural palaces were considered symbols of the new Marxist revolutionary culture, places where workers could both entertain

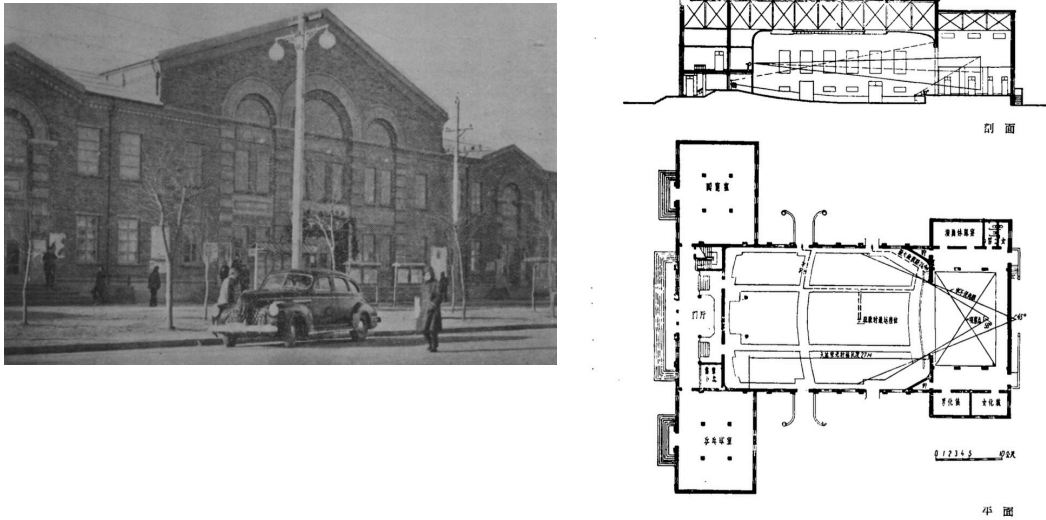


Fig. 4-16 Perspective and technical drawings of the No.1 Tractor Factory Workers' Club.

and educate themselves. In the 1930s, the Communist Party in China established rural clubs in Soviet areas (Pang, 2012, pp.146-150). After the founding of the People's Republic of China, clubs became a key part of the daily life of workers in industrial cities. Each enterprise in Jianxi Industrial Zone had its own workers' club. These spaces provided workers with places to socialize, share experiences, and foster a "worker culture" that would, in turn, shape their professional and personal lives (Zhang, 2018, p.23). The tractor factory's club, for example, housed an auditorium capable of seating thousands (Figure 4-16), and a larger Workers' Cultural Palace was constructed to serve the entire Jianxi district. (Li, 1958. p.22)

To address the need for food, public canteens were built within the major industrial enterprises. "The workers' canteen organizes collective life for employees. Whether a canteen is well-managed impacts thousands of diners' daily lives and health and directly affects production and socialist construction (Zheng, 2015, p.36)." In the Jianxi Industrial Zone, the number of canteens varied depending on the size of the enterprise. For instance, the First Tractor Manufacturing Factory operated as many as 26 canteens at one point (Yituo changzhi bianzhu weiyuanhui, n.d.). Smaller factories, such as the Luoyang Refractories Plant, established two canteens each within and outside their facilities (Luonai changzhi bianxie weiyuanhui, n.d.).

Health services were also prioritized, with each enterprise establishing its own infirmary and hospital to provide medical services to workers, significantly improving the city's overall public health system.

In addition to services for workers, welfare programs were extended to their families. Enterprises operated kindergartens, nurseries, and schools to care for workers' children and ensure their education, thus addressing concerns over family responsibilities. Nurseries were established to help dual-income families with young children, while kindergartens and primary schools focused on building foundational skills for workers' children. Secondary education, on the other hand, served the dual purpose of preparing students for higher education or training them to become skilled workers in the factories.

Another significant type of public building was the enterprise's main administrative building. These buildings, often positioned along the city's central axis and designed with grandeur, were focal points in the urban landscape (Wu & Yu, b. 2024). The main administrative buildings typically followed a tripartite structure, a design derived from classical Western architecture. This design, frequently employed in Stalinist cities, conveyed a sense of solemnity and importance. The administrative buildings of the Jianxi Industrial Zone adopted this style, playing an essential role in shaping the city's urban landscape.

4.3.3.2 Enterprise-driven construction system

Most of these new types of public buildings were built to serve the needs of industrial enterprises, and their distribution was closely tied to the corresponding enterprises. In fact, during the early years of industrial city construction in China, both housing and public buildings were predominantly built by the industrial enterprises themselves. This enterprise-led development created a unique urban development model.

As a result, the spatial layout of these public buildings followed a clear pattern. Clubs, canteens, bathhouses, schools, and hospitals were mainly located within the residential areas of industrial enterprises. This spatial arrangement mirrored Milutin's "linear city" concept and complied with the planning standards for public facilities based on per capita needs and service radii.

For example, the Luoyang Refractories Plant, established in 1958, provides a clear illustration of the distribution of these facilities (Figure 4-17). The plant's residential area was composed of four "blocks," and the corresponding public buildings were evenly distributed among them. Workers could easily access these facilities by foot, ensuring convenience in daily life.

In addition to enterprise-built public buildings, city-level facilities were also developed to serve the broader population, including administrative buildings, public hospitals offering higher levels of medical care, department stores, and schools. Although these city-level buildings provided similar services to those built by enterprises, they catered to a wider audience and offered more specialized services.

There are two main reasons for this distinction. First, while industrial enterprises employed the majority of the population, other social entities also existed, such as local collective enterprises, administrative agencies, and commercial organizations. These smaller institutions could not afford to build their own public service infrastructure, relying instead on city-level facilities. For instance, the municipal education system operated schools alongside those run by enterprises, collectively forming the city's education network.

Second, city-level public services often offered a higher degree of specialization. For example, while enterprise-run infirmaries and hospitals could handle common illnesses, patients needing more advanced care had to rely on municipal healthcare institutions. Similarly, while workers could purchase basic

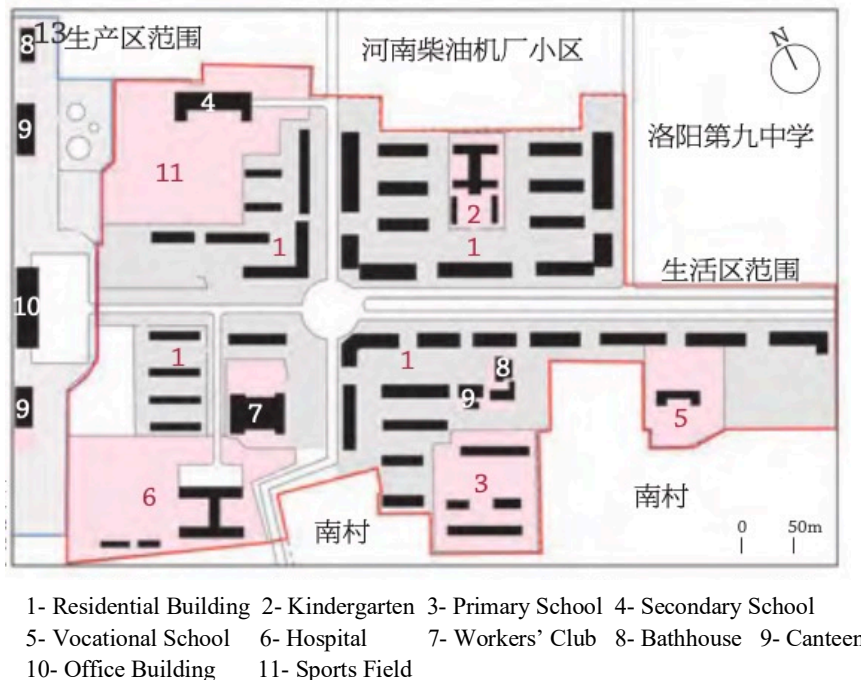


Fig. 4-17 Illustration of facilities in the living quarters of the refractory materials factory in the Jianxi Industrial Zone

daily goods through enterprise stores, department stores provided a more diverse range of products.

These distinctions help clarify the distribution of public buildings in the Jianxi Industrial Zone (Figure 4-17). Most public buildings were provided by the dominant industrial enterprises, creating a self-contained public service system within each enterprise. However, city-level public buildings were fewer in number but more evenly distributed, forming a complementary “enterprise-led, government-supported” public building and service system.

4.3.4 Reshaping urban public spaces

4.3.4.1 Parks

After the founding of the People’s Republic of China, Soviet urban planning methods were adopted, along with Soviet approaches to public space design. In the Soviet Union, parks were seen as cultural spaces imbued with strong ideological significance. Their design not only emphasized landscaping but also incorporated entertainment facilities, aiming to integrate leisure, health-promoting activities, and rational entertainment in picturesque surroundings (Liu, 2017, pp.35-41). Similarly, Soviet city squares served ideological purposes, providing spaces for both daily activities and large-scale celebrations or public gatherings. Often, these squares were located near significant buildings to create an artistic urban space.

In the planning of the Jianxi Industrial Zone, parks were designated as recreational spaces and positioned within residential areas according to the “linear city” planning concept. The 1954 plan for the Jianxi Industrial Zone included two parks. However, during actual construction, only one large park was built in the early stages, located at the intersection of Jianxi and Xigong districts, near the main road on the east side of the Jian River. Due to its location on the site of the former Zhou Dynasty royal city, the park was named “Wangcheng Park.” Construction began in September 1955, and the park officially opened in January 1956 (Gao et al, 2004, p.170).

Of the two parks planned in the 1954 Jianxi Industrial Zone layout, only the one near Tang Village was built. The site originally served as a nursery for the village and was converted into a park in the 1960s with contributions from various industrial enterprises and research institutes. This became the first major park in the Jianxi Industrial Zone (Figure 4-18). The delayed construction of the park reflects

the Jianxi Industrial Zone’s “production first, life later” approach, where industrial production facilities and housing were prioritized over recreational spaces.



Fig. 4-18 Distribution Map of park and squares in the Jianxi Industrial Zone; they are important public spaces and landscape nodes of the city.

4.3.4.2 Squares

Another key type of public space in the Jianxi Industrial Zone was the “public square.” These squares can be divided into two types based on their location: factory-front squares and city squares. Unlike parks, squares not only function as public spaces but also play a critical role in shaping the city’s artistic and spatial character. Often located along urban axes, squares are designed to create a sense of spatial order and sequence. Their design, combined with specific activities and decorations, can foster a sense of identity and pride among residents. According to art historian Wu Hung, the “squares” built after the founding of New China were highly political spaces. They were intended for large public gatherings during holidays and celebrations, serving as venues for transmitting governmental messages. Between the 1950s and 1970s, there was a significant enthusiasm for constructing public squares in China (Wu, 2005, p.22).

Although several city squares were planned in the Jianxi Industrial Zone (Figure 4-7), only one, Peony Square, was built. Located at the eastern end of the city’s secondary arterial road, Peony Square was a large space covering 13.25

hectares. The square's other end formed the starting point for a road network connecting Jianxi with Xigong and the southern bank of the Luo River, creating a radial road layout. This design not only harmonized the divergent road directions of Jianxi and Xigong but also imbued the city space with a European urban aesthetic, aligning with the prevailing urban design preferences of the time.

Factory-front squares, on the other hand, were smaller public spaces located in front of the main administrative buildings of various enterprises (Figure 4-19). The tractor factory had a 4.85-hectare factory-front square, the bearing factory had a 2.05-hectare square, and the mining machinery factory had a 1.5-hectare square (Ding, 2007, p.125). These squares had a more complex role than city squares. While they served a traditional traffic function, they also acted as transitional spaces where workers passed through on their way to and from work. Factory-front squares served as the boundary between work and home, public and private life. They also played an important role in corporate identity, fostering a sense of belonging, collective pride, and responsibility among employees. During holidays, these squares were adorned with festive decorations, such as lanterns, transforming from everyday pass-through spaces into vibrant gathering places for celebration.

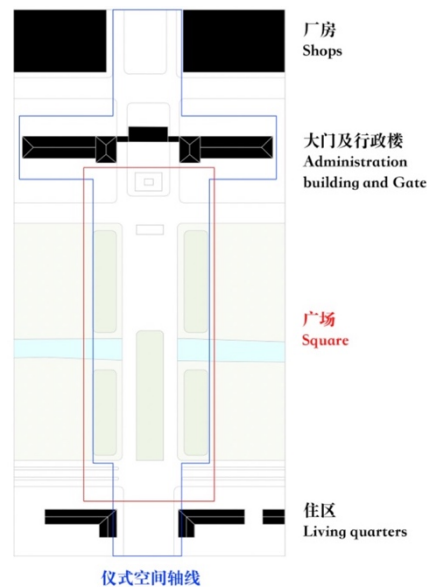


Fig. 4-19 The creation of square space at the entrance of industrial enterprises, with the Luoyang No.1 Tractor Factory as an example

4.3.5 Clearly defined urban road system

The road system in the Jianxi Industrial Zone is well-organized and meets the transportation needs of a modern city (Figure 4-20). In the linear city plan, a road that connects with other cities, along with the railway, constitutes an important part of the city's transportation network. This road ensures that raw materials and products can be exchanged between different industrial cities. In the planning of the Jianxi Industrial Zone, this road connecting other cities is the new Luoyang-tonggaun Road. Within the city, this road also connects the three areas of Jianxi, Xigong, and the old city, forming the main urban transportation network.



Fig. 4-20 Road System of Jianxi Industrial Zone

Once the industrial zone site was determined, a city arterial road (New Luoyang-tongguan Road) was built just south of the old Luoyang-tongguan Road, running almost parallel to it. This road was referred to as the city’s artistic main road (艺术干道), later named “Zhongzhou Road.” On the north and south sides of this road, following the principles of the linear city plan, residential areas and industrial production zones were respectively arranged. In addition to the artistic main road, another major road and two secondary roads were laid out in parallel. The major road, Xiyuan Road, served to separate the industrial residential areas from the research and higher education institutions, while the secondary roads were Jinghua Road between residential areas and Jianshe Road adjacent to the industrial production areas. These four east-west city roads divided the different functional blocks of the linear structure of the Jianxi Industrial Zone.

In the north-south direction, several secondary roads were also constructed in the Jianxi Industrial Zone, which were generally shorter and narrower than the east-west city roads. These vertical roads primarily connected the residential areas, research areas, and the gates of industrial enterprises, making commuting easier for workers at the major industrial enterprises. Additionally, these roads often intersected with the factory squares and office buildings of the industrial enterprises, creating certain visual effects and enhancing the cityscape.

These main and secondary east-west and north-south roads formed the primary road framework of the Jianxi Industrial Zone. Within this framework, there were also smaller side streets that connected the various residential areas or linked the residential areas with public service facilities, minimizing the walking distance within large residential areas and making it easier for residents to travel to work and access services.

Based on the different functions of these roads, the cross-section designs also varied. For example, the city arterial road adopted a “three-part layout (sankuaiban, 三块板)²⁵”, with a two-way, four-lane middle section and wide non-motorized lanes on both sides, separated by green belts. Xiyuan Road had a two-way, four-lane design, with non-motorized lanes sharing the same surface as the motorized lanes, and a wide flowerbed in the middle separating them (Gao et al., 2004, pp.123-125). Jinghua Road and Jianshe Road were progressively narrower, reflecting the differences in hierarchy among these city roads.

It is worth noting that during the planning of Luoyang, the city’s reference was still Stalinist urban art style. The road layout was designed in combination with the cityscape, and the resulting block divisions were an important reference for forming the neatly aligned street facades of the kvartal. Although from the late 1950s onwards, the residential form in the Jianxi Industrial Zone shifted from kvartal to microdistrict, the previously planned road system remained, thus preserving the basic structure of the Jianxi Industrial Zone as its initial plan.

In addition to the basic transportation function, the road system in the Jianxi Zone also served as a “boundary” between the various industrial enterprises. The size and scale of the enterprises determined how many residential blocks they possessed. Under the “enterprises managing society” model, roads became the invisible boundaries between these “island-like” danwei, forming the basis for the archipelago-like urban structure shaped by the danwei system.

²⁵ In road cross-sections, the “three-part layout” usually refers to the segmentation of the road into three main functional areas: motor vehicle lanes, non-motor vehicle lanes, and sidewalks. This design is called the “three-part layout” because the cross-section of the road resembles three distinct segments, each serving a different traffic function. The primary purpose of the “three-part layout” is to separate traffic functions, improve traffic safety, and reduce interference between different modes of transportation. This segmentation ensures that each mode of transportation has a clearly defined space, enabling orderly and efficient road use while enhancing pedestrian safety.

4.4 Summary

After the founding of the People's Republic of China, in the context of socialist industrialization, Luoyang was established as one of the eight key cities for national development, receiving funding support and policy attention. Against this backdrop, Luoyang once again adopted the urban development strategy of “building a new urban area near the old part of the city,” and was the first to plan and construct an entirely new industrial zone to the west of the Jian River.

The urban form of the Jianxi Industrial Zone is derived from the “linear city” planning concept. This idea originated in Europe at the end of the 19th century and was further clarified during the 20th-century discussions in the Soviet Union regarding socialist cities. The linear city planning divides urban areas into distinct zones, with railways, industrial production zones, and residential areas laid out sequentially. In the urban form of the Jianxi Industrial Zone, a similar spatial arrangement can be observed, reflecting the application of modern industrial urban planning concepts in Luoyang.

From the perspective of its constituent elements, the urban form of the Jianxi Industrial Zone is also more diverse. First, the presence of numerous industrial buildings highlights the industrial nature of Luoyang as a city. Secondly, the new residential areas, arranged in peripheral or row-based layouts, dominate the urban residential space. These, along with the industrial buildings, become the main components of the urban form of the Jianxi Industrial Zone. In addition, as the public service network was built, the types of public buildings also became more varied. These buildings, located in key areas, serve as embellishments at the city scale, and together with the newly introduced urban public spaces like plazas, they play a significant role in shaping the artistic quality of the city. Behind these urban form elements is a modern street network that meets the demands of modern transportation, ensuring the efficiency of urban circulation.

In summary, the Jianxi Industrial Zone is an urban area formed under the backdrop of industrialization, based on linear city planning. While reflecting the efficiency-oriented characteristics of modern industrial cities, it also laid the foundation for the subsequent reconstruction of modern Luoyang.

Chapter 5

Modernization from east to west: characteristics of Luoyang's urban form and urban transformation

The previous three sections discussed the half-century span during the late Qing, Republican, and early post-1949 periods, during which Luoyang experienced two phases of urban development characterized by the “building a new urban area near the old part of the city” approach, creating a disjointed in time and space. This development led to the formation of three distinct urban forms: “traditional,” “military,” and “industrial.”

Unlike the earlier sections, which treated urban form as a reflection of specific historical contexts projected onto urban space and discussed each area's form generation and characteristic elements “from history to urban form,” this chapter will take a holistic view of the city. It adopts a “urban form to urban transformation” perspective to compare the differences between the three urban forms of the old city, Xigong, and Jianxi. By analyzing these changes of urban form, it will explore Luoyang's urban transformation and the social changes behind it.

This chapter is divided into two parts to discuss the relationship between urban form and Luoyang's modernization. The first part will examine the modernization process as reflected in the transformation of urban forms. The second part will, based on historical records, discuss the social conditions behind different urban forms, analyzing the characteristics of urban transformation across various periods. This will help explain why the post-1949 urban development model laid the foundation for the modern urban structure of Luoyang.

5.1 The modernization process behind different urban forms

Since modern times, Luoyang's two phases of "building a new urban area near the old part of the city" have created distinct morphological foundations across different urban areas. The old city represents a continuation of history, perfectly embodying traditional Chinese urban concepts. In contrast, the Xigong area, constructed during the Republican period under the context of military modernization, uses the military camp as the organizing logic for urban space. After the founding of the People's Republic of China, Luoyang began its transition into an industrial city, following the Soviet model, and its industrial zone reflected the idealized form of a socialist industrial city.

Behind these different urban forms are corresponding morphological elements. Their changes—whether in addition, omission, continuity, or rupture—provide a basis for interpreting urban development. The discussions in the previous three chapters have illustrated the different morphological elements behind various urban forms in different periods. The purpose of this section is to compare and analyze the similarities and differences among these elements.

5.1.1 Formation of modern urban from

5.1.1.1 Gradually clarified urban zoning

From the perspective of urban development, modern urban planning ideas were born alongside the Industrial Revolution and the development of industrial cities. Among these planning ideas, modern urban zoning became one of the core concepts of rationalist and functionalist city planning (Wei & Xu, 2020, pp.129-138). The origins of zoning can be traced back to the 1884 planning practices in Frankfurt, Germany (Jiang & Liu, 2014, pp.12-15). Around the same time, German architect Theodor Fritsch's concept of the City of the Future (Theodor, 2011) and British sociologist Ebenezer Howard's Garden Cities also reflected the influence of zoning (Hall, 2014, pp.100-123). By the 1930s, with the presentation of the "Athens Charter" at the International Congress of Modern Architecture (CIAM), functional zoning was further clarified as a hallmark of modern cities, stressing the clear division between traffic, pedestrians, residential areas, and industrial zones. Architectural theorist and historian Sigfried Giedion remarked that "the fundamental law of contemporary cities requires granting freedom to traffic,

pedestrians, residential areas, and industrial zones, and the only way to achieve this freedom is to separate them. (Ladd, 2020, p.293)”

In contrast, the principles of traditional Chinese urban planning were far removed from these modern concepts. Although the development of commerce and industry in coastal and riverfront cities during the late Qing Dynasty altered the appearance of some cities, and modern urban management departments such as the Municipal Council (工部局) emerged (Liu, 2014, p.44), systematic modern urban planning was still lacking. It wasn't until after the nominal unification of the country by the Nanjing Nationalist Government in 1928 that attempts were made to establish a modern urban planning system, with efforts such as the nationwide promotion of “Urban Planning Committees.” Some key cities also began planning work, with the most famous being the “Capital Plan (首都计划)” of 1927, advised by American architects Henry Murphy and Ernest Goodrich, and the “Greater Shanghai Plan (大上海计划)” of the same era. Concepts like urban zoning and garden city theory were introduced and applied in related urban planning (Jiang & Liu, 2014, p.13). However, due to financial constraints and the Japanese invasion, large-scale urban planning efforts were not fully realized, and even Nanjing's capital plan was never fully implemented.

Luoyang as an inland city located in the heartland of central China, it never developed a clear urban plan, even though it was briefly designated as the administrative capital during the Republican period. As a result, it wasn't until the 1950s, when the second phase of “building a new urban area near the old part of the city” occurred, that modern urban zoning emerged.

Figure 5-1 illustrates the changes in urban functional zoning in Luoyang over different periods. First, the old city, as a traditional city, had no modern functional zoning. The city walls divided the “inner city” from the “outer city.” Inside the walls, there were administrative institutions representing imperial authority and ceremonial buildings, making it the political, economic, and cultural center of Henan Prefecture. Outside the walls were residences for merchants and civilians. The city walls served both as the boundary for urban zoning and as a spatial separation between the “official” and the “civilian” sectors.²⁶

²⁶ In ancient China, the populace was divided into four social strata based on their occupations: scholars (士), farmers (农), artisans (工), and merchants (商). In the early period, the areas within city walls were primarily reserved for the residences of the scholar class (士). Merchants, being ranked the lowest among the four classes, were not initially entitled to reside within the city.

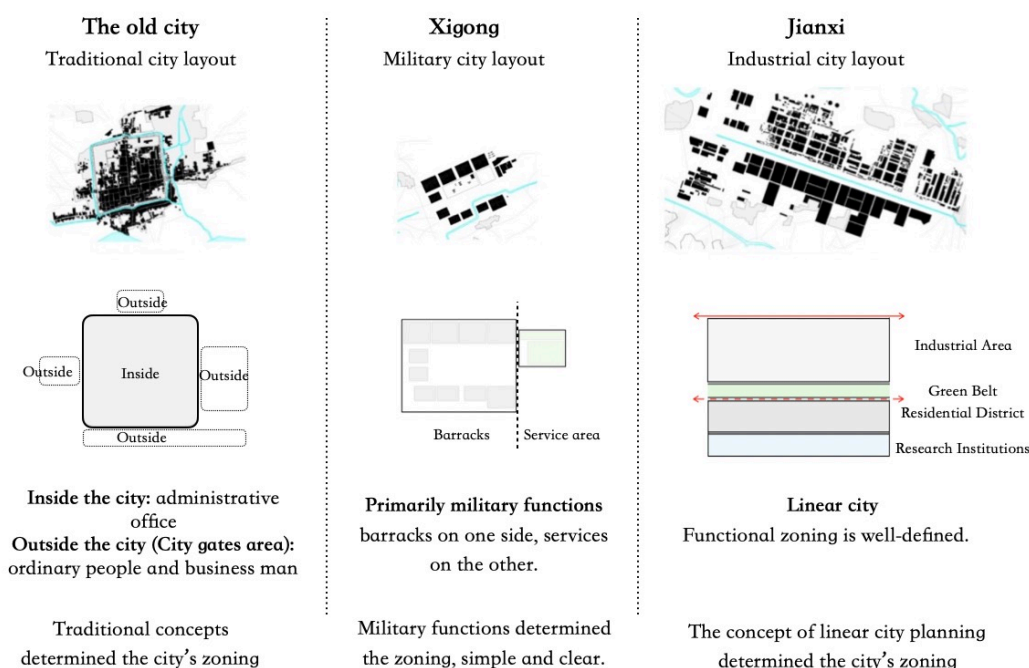


Fig. 5-1 the character of the zoning of Luoyang in different development phases

The Xigong, established with the construction of military camps in 1914, initially had a simple and singular function. This area was dominated by military camps, with a marketplace built to the east to serve the camps. The zoning of Xigong was straightforward, with a clear distinction between military and service spaces. After the Nationalist Government moved its capital to Luoyang, the Xigong became the office for the government's local institutions and military schools, diversifying its functions. However, Xigong's functional zoning still did not exhibit the structure expected of a modern city.

When viewed as a whole, combining the old city and Xigong into one urban area, a relatively clear zoning system seems to emerge. During the Republican era, Xigong gradually became a more influential political center, while the old city remained a space for civilian life, creating a dual-core city structure with Xigong as the military and administrative space and the old city as the civilian space. However, this clear functional zoning was not based on any urban planning theory, but rather emerged from the military purposes of the warlord-dominated period. Even after Luoyang was designated as the administrative capital, the imbalanced development

Furthermore, the scholar class (士) often held official status, meaning that areas within the city walls were primarily occupied by officials, while areas outside the walls were inhabited by commoners.

between Xigong and the old city remained evident. More importantly, despite its new designation, Luoyang never truly received significant attention from the Nationalist Government, retaining its status as “Luoyang County” and lacking an urban planning agency, such as an Urban Planning Committee (都市计划委员会).

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It was only after the founding of the People’s Republic of China that Luoyang was designated one of eight key cities, thus marking the beginning of true modern urban planning, with modern functional zoning taking shape in its linear city form. At this time, the spatial organization logic of the city, centered around industry, became clear, with relatively independent yet closely connected relationships between industrial, residential, and city areas.

Importantly, this plan did not only focus on the Jianxi district but also included the old city and Xigong areas. While the planning team was drafting the Jianxi Industrial Zone’s plan, they also sketched a citywide master plan. This plan carefully considered the future development of Xigong and the old city, establishing a structure where Jianxi was the industrial zone, the old city retained its historical features, and Xigong was set as the city’s future center, forming a “one core, two subsidiary (一主两副)” urban structure. This gradually integrated Jianxi, Xigong, and the old city, further advancing Luoyang’s development into a socialist industrial city.

In conclusion, from the 1910s to the 1960s, from the eastern old city to the western Jianxi Industrial Zone, the concept of modern functional zoning emerged—

²⁷ “Luoyang County” was a larger geographical area that included not only the city and the four gate-areas but also the towns and villages within this administrative jurisdiction. During the Qing Dynasty, Henan Province was divided into a three-tier administrative structure: “province-prefecture-county (省-府-县).” Between the province and the prefecture (or directly governed sub-prefecture), a level called “dao (道)” was set up to supervise government officials. In the early Republic of China, the administrative divisions of the Qing Dynasty were adjusted, abolishing the prefecture level, but retaining the old dao jurisdiction, thus forming a three-tier structure: “province-dao-county.(府-道-县)” After 1927, the Nanjing Nationalist Government further adjusted the administrative divisions, abolishing the dao level and switching to a two-tier system of “province-county.(省-县)” In 1928, the implementation of the “City Organization Law(市组织法)” led to the establishment of some cities based on local population and financial status. These included “Executive Yuan directly governed cities (院辖市)” and “province governed cities (省辖市)”—the former being on the same level as a province, and the latter on the same level as a county. During the Republic of China period, only Kaifeng and Zhengzhou counties in Henan Province briefly had “city” status, but both were abolished after a short period. As a result, population statistics during the Republic of China period were often based on “county” as the fundamental unit.

transforming from a traditional city's ritual space to the passive appearance of zoning under military construction, and finally to the modern industrial city's zoning, showcasing Luoyang's transformation from a pre-modern agricultural city to a modern industrial city on a macro level.

5.1.1.2 Urban development driven by industrialization

Behind the gradual clarification of urban functional zoning in Luoyang, the transformation of industries is a topic that cannot be overlooked. According to the general rules of modern urban development, industrialization is often accompanied by urban modernization (Li, 2008, p.130). In fact, Luoyang benefited significantly from the wave of socialist industrialization in the early years of the People's Republic of China, which provided early and strong development opportunities. From this perspective, the rapid transformation of its industrial structure was a key factor in the comprehensive advancement of Luoyang's modernization.

Historically, since the Qin (秦) and Han (汉) dynasties, China gradually formed the concept of prioritizing agriculture while suppressing commerce, which led to an economy primarily based on agriculture. This focus on agriculture limited the development of industry and commerce, which are crucial to urban expansion. Even during the Qing Dynasty, agriculture remained the main source of the national economy and taxation. For example, in 1700, China's economy was 7.7 times the size of England's, but industrial and trade output accounted for only 30% of the total economy in China, compared to 45% in England. In terms of taxation, China's industrial and trade taxes made up only 17% of the Qing government's total revenue, whereas England's reached 66%. Even France, whose economic structure was similar to China's,²⁸ saw industrial and trade taxes comprise 54% of its revenue (Li, 2022, p.55).

At the end of the Qing Dynasty, although people gradually recognized the importance of industry and commerce, and the government attempted to open industries to achieve national survival and self-strengthening, this still did not lead to a transformation in the industrial structure of cities. Initially, light industries related to daily life dominated, and while some military and heavy industries were later established by the Qing government and private capitalists, their distribution was highly uneven. (Su, 2010, pp.26-27) As a result, for most inland cities like

²⁸ France, similar to China, once exhibited a strong physiocratic tendency, which was more or less influenced by Chinese thought. Therefore, from a physiocratic perspective, France's economic structure was quite similar to that of China.

Luoyang, the lack of industrial development hindered the transition to modern urbanization, let alone the formation of modern urban structures.

Luoyang, despite its convenient water and land transportation, was located in Henan Province, an important grain-producing region of China, and had long been dominated by agriculture. During the wave of industrialization at the end of the Qing Dynasty, Henan's industrial development lagged behind that of neighboring provinces like Hubei and Zhili (直隶),²⁹ with a focus primarily on light industries, and these industries were mainly concentrated in the northern part of Henan and the provincial capital, Kaifeng (Zhang, 2015, pp.135-140). During the early Republic of China period, despite being a site of military interest for warlords, Luoyang did not experience the industrial transformation seen in coastal and riverside cities, nor did it become a key center for industrial development within Henan. Even in the National Government's proposal for the construction of the Luoyang Capital and Chang'an Secondary capital, apart from plans for a power plant, no further industrial development projects were outlined (Shannxi difangzhi bangongshi, n.d.).

The real transformation began after the founding of the People's Republic of China, when Luoyang, as one of the first key cities, undertook several important heavy industrial projects closely tied to the national economy, facilitating the transition of the city's economy from agriculture to industry. This transformation became a driving force behind the city's development, population growth, and changes in urban form.

In the context of socialist industrialization, Luoyang, as a key construction city, received substantial policy support in terms of funding, industries, and technology. Like other key construction cities, Luoyang experienced a rapid transition from lacking modern urban planning and public utilities to taking the shape of a nascent socialist industrial city, with significantly accelerated urban growth.

Changes in population numbers further illustrate the impact of industrialization on Luoyang's urban development after the founding of the People's Republic of China. Although the city experienced some development during the Republic of China period, the population of Luoyang County did not grow, and even declined at times. It was only after the establishment of the People's Republic that Luoyang's

²⁹ "Zhili" was a provincial-level administrative division during the Qing Dynasty, with its jurisdiction primarily covering the areas of present-day Hebei, Beijing, and Tianjin. In 1928, the National Government of the Republic of China in Nanjing abolished Zhili and renamed it Hebei Province.

urban population began to increase significantly. According to Ding Yiping's research on Luoyang's industrial migration between 1953 and 1966, Luoyang's urban population at the beginning of liberation was 62,511 people,³⁰ which increased to 83,395 by 1953. With the construction of the Jianxi Industrial Zone, the city's population surged to 116,875 by 1954, 191,542 by 1955, and 252,982 by 1956 (Ding, 2007, p.71). This rapid population growth was mainly driven by unrestricted rural-to-urban migration, as well as the large number of construction workers needed for the development of the Jianxi Industrial Zone.

After the major industrial enterprises began operations, the number of industrial migrants increased significantly, becoming the main population in the Jianxi Industrial Zone. According to statistics, the employees and their families of the first batch of completed "four factories and one station" in the Jianxi Industrial Zone numbered 83,592 people (Ding, 2007). If we include the newly established factories, research institutes, and service institutions, industrial workers and their families accounted for 90% of the total population of the Jianxi Industrial Zone (Ding, 2007).

These population changes align with the broader trends in modern urban development in Luoyang, demonstrating how industrial construction contributed to population growth and the urbanization of the population, as well as how modern industrial development fundamentally drove the city's progress.

Moreover, the development of industry is also directly reflected in the city's physical form. In the traditional urban layout of the old city, large-scale modern industrial developments were absent. While there was some industrial development during the Republic of China period, it did not have a noticeable impact on the city's form. After the founding of the People's Republic, however, the industrial landscape of Luoyang expanded significantly. The spatial arrangement and zoning of the Jianxi Industrial Zone, designed according to the principles of an industrial city, were aimed at placing Luoyang within the overall national industrial framework while improving the efficiency of both industrial production and social life within the city. In the Jianxi Industrial Zone's planned area of 15 square kilometers, industrial land accounted for nearly one-third of the area, occupying 4.68 square kilometers (Ding, 2007, p.75). The industrial buildings on these sites

³⁰ After the liberation of Luoyang in 1948, the People's Government separated Luoyang City from Luoyang County. The newly established city included the old city, Xigong, as well as surrounding villages such as Xiachi, Wunvzhong, Qujiatun, Xixiaotun, Jingu Garden, Yuejia Village, Mapo, and Tawan. As a result, there was a distinction between "county population" and "city population" in population statistics.

became key elements of the Jianxi Industrial Zone's urban form, visually demonstrating Luoyang's transition from an ancient "consumer city" of the agrarian era to a "producer city" in the socialist era.

5.1.2 Modernization of residential settlements

5.1.2.1 From traditional courtyards to modern residences

Since the 19th century, the effects of industrialization on cities have become increasingly apparent, with the working class in urban areas growing significantly and gradually becoming the main body of the citizenry. To address the poor living conditions of the working class, Western European countries were the first to explore mass housing and developed various residential construction and community planning concepts (Glendinning, 2021, pp.11-12).

Different residential settlement forms directly reflect the historical periods and political contexts in which cities were shaped. As a key factor influencing urban form, new housing forms have driven the reshaping of urban spaces. A closer look at cities in Eastern Europe or Central Asia reveals the stark contrast between older urban areas and the new towns planned under Soviet ideology, with freely arranged microdistricts creating a clear distinction from the traditional urban fabric (Figure 5-2).

Since the introduction of Western urban ideas and architectural technologies in modern times, Chinese cities have undergone drastic changes in scale, and the form of residences, as a key component of urban morphology, has transitioned from pre-modern to modern. The focus of residential design has shifted from extended families to nuclear families. This shift in residential forms has led to different urban spatial structures, causing a discontinuous and fragmented urban form.

In Luoyang, the two phases of building a new urban area near the old part of the city that took place between 1910 and 1960 saw two main types of residential settlements emerge (Figure 5-3). The first was the courtyard-style residence, characterized by highly regular spatial organization. These houses extended the traditional inward-facing nature of Chinese cities, with narrow, elongated courtyards forming the basic unit. The number of courtyards and the width of the houses could be adjusted flexibly.

The second type emerged during the early years of the People's Republic of China, with the construction of modern housing and residential communities

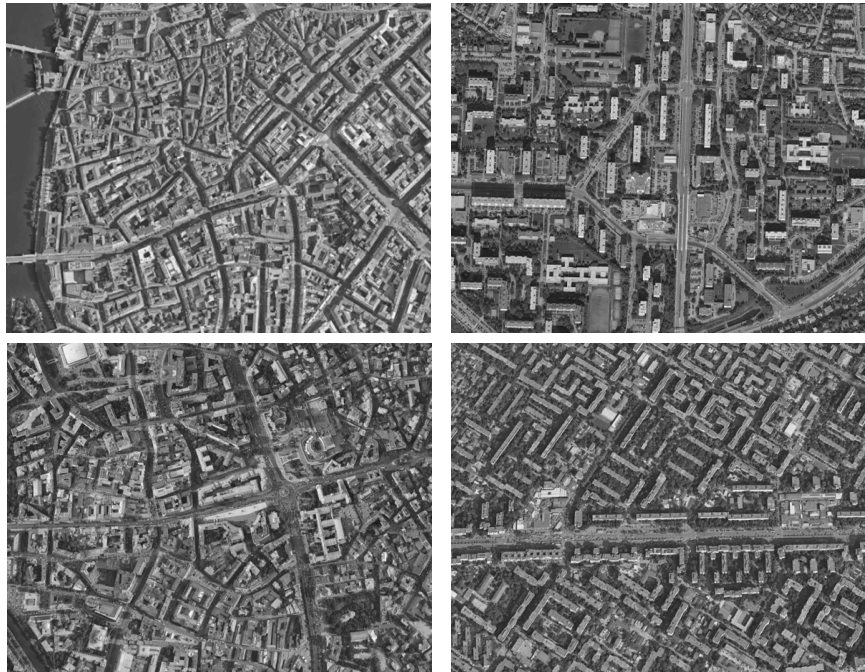


Fig. 5-2 Top left: Traditional urban form of the old town in Prague; Top right: microdistrict in the new town of Prague. Bottom left: Traditional urban form of the old town in Bucharest; Bottom right: Urban fabric of the new town in Bucharest (Source: Google map)

	Urban tissue	Residential form	Basic Residential Unit	Characteristic
Traditional Settlement				<ul style="list-style-type: none"> Multi-generational cohabitation Poor ventilation and lighting, low economic efficiency Lack of water supply, drainage, and power facilities Insufficient supporting infrastructure <p>Meets the requirements of traditional social hierarchy and norms</p>
Modern Settlement				<ul style="list-style-type: none"> Designed for nuclear families Good ventilation and lighting, high economic efficiency Complete water and power supply facilities Well-equipped with supporting infrastructure within the residential area <p>Based on the requirements of modern industrial society</p>

Fig.5-3 the difference between courtyard housing and apartment building

accompanying the development of Luoyang as an industrial city. Whether in the early kvartal blocks or later microdistricts, both housing forms, despite differences in layout, exterior façades, decoration, and internal design, represented a more modern type of residence compared to courtyard-style housing. These modern housing forms dominated the development of urban morphology in Luoyang for a long time.

These two housing forms were mainly distributed in the old city and the Jianxi district, while the Xigong district seemed to be overlooked. In reality, as previously discussed, Xigong was initially built primarily for military purposes. Although its function later shifted to serve as an administrative center, it was mainly composed of repurposed military barracks. Although officer residences were built during the construction of the barracks, they were designed for military officers and government employees, and their scale was insufficient to significantly influence the city's morphology. Thus, it is not appropriate to include them in discussions of residential changes.

In summary, the modern housing and residential community models that first appeared in the Jianxi Industrial Zone were, on the surface, inspired by Soviet socialist residential settlements. More deeply, however, they reflected the global inheritance of mass housing practices. Compared to traditional courtyard housing in the old city, modern apartment-style residences were equipped with a comprehensive system of municipal services, embodying the integration of economy, rationality, and efficiency (Wu & Yu, b. 2024, p.163). Moreover, these modern housing forms had more than just technical significance; they also heralded new social relationships, promoting the modernization of residents' lifestyles.

5.1.2.2 The impact of new housing forms on citizens' lives

(1) Family structure

In ancient China, urban residences often belonged to officials and large families (Lu & Ma, 2009, p.84), with multi-generational households reflecting strong kinship and clan ties, which were hallmarks of China's longstanding Agrarian Society(乡土社会) (Fei, 2007, p.84). In contrast, modern apartment-style housing carried an active social vision from its inception, designed to accommodate the general populace. Modern housing's compact spaces were primarily intended for nuclear families, and this simplified family structure was better suited to the needs of industrial life.

In the Jianxi Industrial Zone, modern apartment housing completely replaced traditional courtyard-style housing, signifying that large extended families in traditional cities were being replaced by nuclear families suited to the industrial era. This change reflected the decline of familial structures based on kinship and clan ties, which had persisted for thousands of years, and the rise of new family structures driven by industrialization. (Wu & Yu, c. 2024, p.16) In this context, the

social network within cities was also reshaped, shifting from trust built on familial and ethical relationships to trust in universal and abstract institutions. (Chen & Long, 2009, pp.114-118; Ding, 2007, p.171) This transition is a key marker of the journey toward modern society.

(2) Living efficiency

The family is the “endpoint” of an industrial city’s efficiency system and a key component of the overall efficiency structure of a linear city that spans from the individual to the factory, the city, and the nation. Compared to traditional courtyard-style housing, modern apartment residences and residential communities were designed based on rational principles. These designs efficiently organized all the functional spaces necessary for family life within limited space, including some new spaces that had not existed in traditional courtyard-style housing. A typical example of this is the modern kitchen, whose prototype can be traced back to the Frankfurt Kitchen, designed by architect Margarete Schütte-Lihotzky around 1926. The Frankfurt Kitchen reduced the kitchen area from the usual 11 m² to just 5.5 m² while maintaining functionality and efficiency by arranging all the workspaces within arm’s reach, making the kitchen as efficient as a factory’s production line. Despite its reduced size, the kitchen still accommodated the storage, preparation, and cooking of family meals (Teige, 2002, pp.218-220).

The introduction of concepts like the modern kitchen and bathroom reshaped the layout of Western modern apartment housing. Through exchanges between Western European countries and the Soviet Union, Soviet housing also adopted modern residential design methods, which, in turn, influenced Chinese worker housing designs in the 1950s and contributed to the modernization of urban living.

(3) Health and sanitation

Addressing sanitation issues in residential communities and creating healthy living spaces were also key concerns in the development of modern housing. Concepts such as sunlight spacing and row layouts were introduced in this context and gradually gained wider application. Although these concepts are commonplace today, when they were first introduced, they marked a significant departure from traditional housing forms. In the 1926 housing projects led by Ernst May in Frankfurt, many modern residences adopted a row layout, moving away from the more common perimeter block layout in European cities (Teige, 2002, pp.121). This change ensured that each household received ample sunlight and good ventilation.

Traditional courtyard housing, though designed with multiple courtyards, had an inward-facing spatial layout, meaning that rooms on the sides and ends of the courtyard could only open windows facing inward, resulting in inconsistent lighting and ventilation. The single-story design limited the number of residents, making it difficult to accommodate the rapid population growth of the industrial era. Moreover, early reforms of larger courtyards into multi-family dwellings during the early socialist period,³¹ without proper drainage, water supply, or electricity, significantly degraded the living experience. In contrast, apartment-style housing provided higher residential density while ensuring good ventilation and lighting, and it also had complete infrastructure, significantly improving the living conditions of urban residents.

(4) Industrialization

The aspects of modern housing discussed above all point to industrialization as their underlying purpose. These new residential forms were designed to meet the needs of the industrial age, extending the industrial society's pursuit of efficiency to the domestic sphere, promoting changes in residents' lives, and forming the basis of modern social relationships.

Moreover, the new residential communities themselves were products of industrialization. Whether through their economically rational layouts, standardized designs, or the use of prefabrication in construction, these residences represented a departure from traditional housing methods. The shift from artisanal craftsmanship to mechanical manufacturing highlighted how modern design, through rational and economic means, served the precision and efficiency required by modern life (Wu & Yu, b. 2024, P.160).

³¹ In the early years of the founding of the People's Republic of China, the government primarily confiscated private properties owned by bureaucratic capitalists, war criminals, traitors, and counter-revolutionaries, while encouraging the rental of other privately owned urban properties. The increasing urban population in the 1950s put pressure on urban housing, prompting the government to gradually implement socialist reform of private housing. Houses that originally housed extended families were taken over by the government for unified management and distribution, leading to the gradual elimination of private housing in cities.

5.1.3 Public buildings and urban public spaces

5.1.3.1 Public buildings

The public buildings discussed here, along with the public spaces that will be addressed later, represent relatively modern concepts for traditional China. As pointed out by Zhuang Weimin, in traditional China, there was a lack of clear boundaries between the public and private spheres (Zhuang, 2012). Thus, the concept of “public”, and the associated ideas of public buildings and public spaces, were relatively vague in traditional Chinese society. The clarity of the “public” concept can be seen as a key marker of modernization. The American historian Carl Emil Schorske, in his book *Fin-de-Siècle Vienna: Politics and Culture*, noted that “public services were regarded as the skeleton and muscles of the modern city (Schorske, 1979, p.25),” highlighting public services as a fundamental criterion for measuring the modernity of a city. Correspondingly, public services are tied to specific types of public buildings.

In traditional China, society was structured around the dichotomy of officials and civilians, and it would be inappropriate to describe local governance using the term “public services.” In the Qing dynasty, the number of government employees at the county level was limited. There were only a few officials with ranks, and most positions were filled by yamen clerks (吏), whose numbers could reach dozens or even hundreds (Watt, 1995, pp.353-362). Despite this, the limited number of officials was responsible for managing populations of 100,000 to 250,000 people, making it impossible for them to cover all aspects of administration (Xiao, 2021, pp.5-10). Consequently, the gentry(乡绅, 士绅), who held a semi-official, semi-civil status, often played an indispensable role in urban governance, acting as intermediaries between the government and the people, engaging in various aspects of daily social life. The gentry promoted education, constructed water conservancy projects, and, in times of unrest, even organized local militias (Xiao, 2021, pp.5-10), reflecting a unique governance system shaped by China’s historical circumstances.

In the late Qing period, in response to foreign threats, the Qing government attempted a series of reform measures to stabilize its rule and participate more fully in social management. This included establishing new schools for the public, creating government-backed commercial centers, establishing police systems, and setting up public funds and prison bureaus. As a result, a number of institutions providing modern public services began to appear in cities. However, at the outset

of these reforms, these changes were not immediately reflected in urban form. Many of the newly established institutions utilized existing buildings—some were converted from former government offices, while others were repurposed from temples. For example, in response to modern education needs, the Zhou Nan Academy was transformed into the Luoyang County Higher Primary School in 1905; in 1907, the Luoyang County Chamber of Commerce was established using the Dragon King Temple and the Fire God Temple as marketplaces (“Zhengzhang shang de tongye gonghui”, 2023); and in 1910, the Henan Prefecture Sericulture School was established in the former Censorate Office. Although the functions of these buildings evolved over time, their form remained rooted in the traditional courtyard architecture embedded in the city’s space, without evolving into building forms that corresponded with their new functions.

In the early Republic of China period, warlords expanded infrastructure in their controlled cities to consolidate their power, which improved urban public services (Li, 2022, p.156). This pattern also held true for the development of Luoyang, although most construction served military purposes and was concentrated in the “new city” of Xigong, while the old city, where most citizens resided, retained its original form and lacked the types of public buildings associated with modern public services. Even though the Nationalist Government planned to promote the development of Luoyang after it became a provisional capital and proposed the establishment of the Central Plains Social Education Institution (中原社会教育馆) and the National Central Plains Museum (国立中原博物馆) to enhance public education and cultural prosperity, these new institutions were also housed in converted existing buildings, such as the Central Plains Social Education Museum, which was established in the former Zhougong Temple.

In summary, due to the relatively underdeveloped local economy and the insufficient financial support from the central government (“Pingxi gongzhai fengchao”, 1932), Luoyang’s public service network remained underdeveloped from the late Qing period through the Republic of China, and modern public buildings did not emerge. Whether it was the new institutions born out of the late Qing reforms, the city construction under warlord rule, or the Nationalist Government’s establishment of Luoyang as a provisional capital, most public buildings were repurposed from existing temples and residences.

After the founding of the People’s Republic of China, Luoyang developed a modern urban plan, and public service facilities were established alongside the construction of the Jianxi Industrial Zone. However, in the years between the

liberation of Luoyang and the creation of the Jianxi Industrial Zone, government offices and enterprises still operated out of rented private homes in the old city.

The development of public buildings during these periods demonstrates that, in the absence of robust economic conditions and government policy support, Luoyang's public service network struggled to develop, let alone construct public buildings that matched their functions. As a result, from the late Qing reforms to the industrial development of Luoyang, public buildings mainly involved the use of existing temples and residences in the old city. These temporary measures often provided subpar experiences for their users, as described in *Shuo Luoyang* (Talking about Luoyang), which noted that the first marketplace in Luoyang, repurposed from the Fire God and Dragon King Temples,

“The so-called First Market of Luoyang was only about one zhang (a little over three meters) wide, with small shops selling miscellaneous goods on both sides of the alley.”

By the mid-1950s, the completion of the Jianxi Industrial Zone marked the establishment of a modern public service system in Luoyang. Alongside this development came a range of new public buildings with clear functions and diverse forms. These were no longer adapted from traditional courtyard structures but were instead designed with both function and aesthetic requirements in mind. These buildings, which were closely tied to residents' lives, also contributed to the emerging landscape of the new socialist industrial city. Public buildings serving large enterprises and research institutions were established for workers, while at the city level, facilities like the People's Hospital and the Workers' Cultural Palace were constructed to serve the general populace. Together, these new public buildings formed a comprehensive public service system for the city (Tab. 5-1).

5.1.3.2 Urban public spaces

Like public buildings, urban public spaces also evolved from the late Qing period through the Republic of China to the early years of the People's Republic of China, becoming increasingly defined and expanding from limited areas to encompass the entire city. They gradually evolved from single-purpose spaces to multi-layered, multifaceted places that played indispensable roles in shaping the urban fabric.

Period	Late Qing Period	Republican Period	Early PRC Period
Major Public Buildings	<p>Luoyang County Higher Elementary School (originally Zhounan Academy)</p> <p>Henan Prefecture Schools (originally Henan Sacrificial Court)</p> <p>Luoyang County Chamber of Commerce (originally Temple of Duke Zhou)</p> <p>County Educational Office (originally Qingliang Temple)</p> <p>County Post Office (originally Dragon King Temple)</p>	<p>Office of the Henan Circuit Intendant (originally Henan Prefecture Office)</p> <p>Luoyang County Government (originally Luoyang County Office)</p> <p>Zhongyuan Social Education Center (originally Duke of Zhou Temple)</p> <p>Zhongshan Park (originally Henan Prefecture God Temple)</p> <p>New:</p> <p>Army Officer School</p> <p>Military and Police Academy</p> <p>The National Government's Office in Luoyang (Converted from Xigong military camps)</p>	<p>Various levels of people's governments</p> <p>Public security and judicial institutions</p> <p>People's Hospital</p> <p>Luoyang Department Store</p> <p>Workers' Cultural Palace</p> <p>Schools (city-level)</p> <p>Workers' Club</p> <p>Workers' Hospital</p> <p>School for Workers' Children</p> <p>Public Canteens</p> <p>Public Baths (danwei-level)</p>
Characteristics	<p>The late Qing reforms led to the emergence of new institutions in the city, but most of these institutions were transformed from traditional ones, utilizing the existing urban buildings.</p>	<p>The administrative offices in the old city mostly originated from the transformation of existing institutions, maintaining the courtyard-style architectural layout. After the National Government designated Luoyang as the administrative capital, the barracks in the Xigong area were also repurposed into schools and administrative offices.</p>	<p>In the urban construction following the founding of the People's Republic of China, Luoyang saw the development of various types of public buildings, including those at the city level and the unit level. These buildings varied in form according to their functions, collectively forming a modern public service network for the city.</p>

Tab. 5-1 The types and characteristics of public buildings during the Late Qing Dynasty, the Republic of China, and the early years after the founding of the People's Republic of China

Before the Republic of China, Luoyang's traditional cityscape offered few examples of parks or squares, which are seen as modern public spaces. In ancient China, streets had the characteristics of public spaces. However, due to the lack of a clear distinction between public and private, even public streets were often encroached upon by nearby residents. Beyond streets, another type of space

available for public use was often associated with official buildings. The creation of ceremonial spaces in front of government offices (yamen) sometimes resembled squares (Wu & Yu, 2024, p.14), and military training grounds within the city could also become gathering places for citizens (Wang, 2019, p.80). However, these spaces were not designed for public use; the former were primarily used for delivering edicts, while the latter were only available for public use when not occupied by military training.

In the mid-Republican period, responding to Feng Yuxiang's New Life Movement during his tenure as governor of Henan, the city converted the City God Temple into Zhongshan Park (Li, 2017, p.60). However, this transformation merely rebranded a ceremonial building as a park, and neither its spatial structure nor its original function aligned with the modern concept of a park. Later, soldiers from the Central Army Officer School in Luoyang created a slope-side park east of Xigong Barracks, complete with pathways, pavilions, and trees, which they named "Peace Park (Luoyangshi difangzhi bianzuan weiyuanhui, 2011)." However, its location far from the old city meant that it benefited government officials living in Xigong rather than the general populace.

After Luoyang was designated as a key city in 1954, the first completed plan for the Jianxi Industrial Zone not only stipulated relatively high per capita green space standards but also, following Soviet design ideas for parks and squares, planned and constructed parks for workers' recreation and squares for festivals and public gatherings. Additionally, in front of major industrial enterprises, spaces resembling squares were typically created at the entrances, often integrated with the main buildings and city roads. Such public spaces in the city and outside industrial enterprises not only expressed socialist ideology but also became significant factors in shaping modern Luoyang's urban form.

In conclusion, the development of public buildings and public spaces, as integral parts of a modern city, followed a gradual east-to-west progression. From the old city to Xigong and finally to Jianxi, as the forces driving urban development evolved, city construction increasingly focused on the needs of the populace. Accompanying the city's modernization, public buildings and public spaces became clearly defined within the Jianxi Industrial Zone, cementing their role in the emerging urban landscape.

5.1.4 Formation of the modern road system

In Antoine Furetiere's *Dictionnaire universel* of 1690, a street was defined as "space between houses that provides passage for the public. (Ladd, 2020)" Like in ancient China, early European streets were not merely transportation corridors but also served as public spaces. However, as European cities expanded, streets became congested with waste, sewage, and overcrowding. In response, Western countries began planning urban roads, gradually shaping modern streets. These streets were designed not only to improve urban traffic flow and avoid overcrowding but also to integrate infrastructure such as water supply and sewage systems to enhance the urban living environment. Additionally, advancements in transportation, such as the replacement of horse-drawn carriages by trams and later the rise of automobiles, transformed the nature of streets. New transportation technologies increased street speeds and shifted their function from public spaces to purely traffic-oriented corridors (Ladd, 2020, p.24).

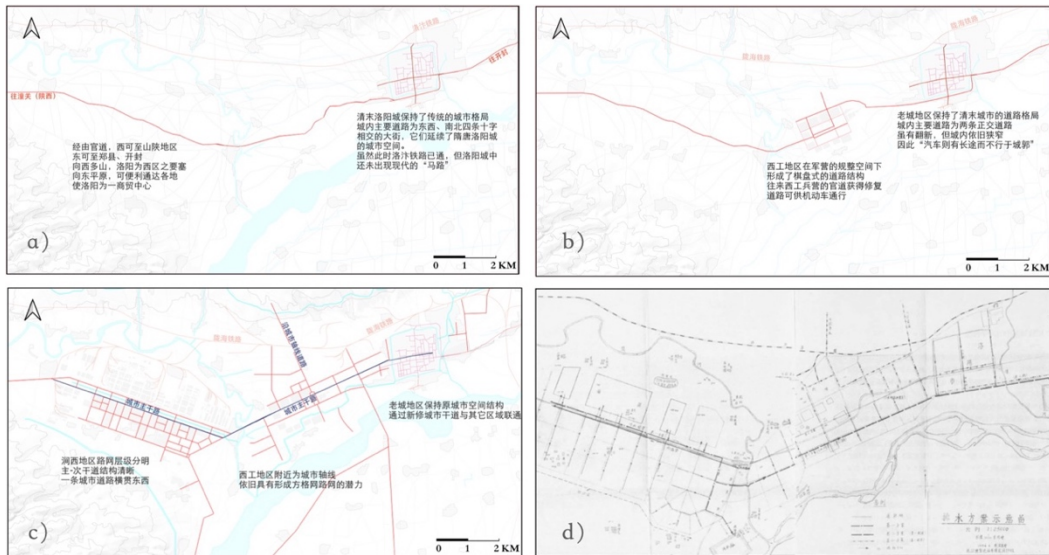
In comparison, modern Chinese urban streets lagged behind those of European nations. While Chinese streets retained their public space functions, they struggled in terms of transportation efficiency and urban sanitation. Peter Carroll's article on late Qing Suzhou streets references a British missionary, John MacGowan, who described Chinese streets as

"Narrow and winding streets, unstable single-story buildings, poorly paved roads, the sight of poverty in slums, and the pervasive, most dreadful and nauseating odors... the streets remained like this all year round. (Li, 2006, p.445)"

However, as Suzhou developed into a treaty port, modern streets were gradually constructed, reflecting both the local struggle against colonial powers and the Qing government's hope for industrial revitalization. While the streets did not become industrial zones, they transformed into new urban leisure centers, with improved transportation and lively surroundings. These changes showcased the positive role of modern streets in late Qing urban spaces, illustrating that streets remained vital components of urban life and played a role in modernizing cities, even as they transitioned from narrow, inconvenient lanes.

The evolution of streets in Luoyang similarly reflects the city's modernization process (Figure 5-4). The streets of the old city were designed according to historical spatial traditions and conformed to the hierarchical demands of ceremonial order. Functionally, the streets in the old city were primarily designed

for pedestrians, though some major streets accommodated horse-drawn traffic. These streets also served as public spaces, fostering social interaction (Ding, 2007, p.119). In this sense, Luoyang’s streets at this time were similar to early European streets, where people were the central focus. However, the condition of these streets was poor, akin to those in old Suzhou, with most being dirt roads that became muddy during rain or snow.



a) The roads are primarily designed for pedestrians rather than vehicles, with the city’s “cross streets” and the outer “official roads.” b) During the Republic of China period, the surrounding roads were reorganized, and the Xigong military camp adopted a grid layout, allowing vehicular traffic. c) After the founding of the People’s Republic of China, a comprehensive urban road network was planned, integrating urban utilities such as the city’s water supply system as shown in the design diagram in d).

Fig.5-4 The changes in the urban road network of Luoyang from the late Qing Dynasty to the early period of the People’s Republic of China.

In the Republican period, the Xigong district, built under the first phase of “building a new urban area near the old part of the city,” was driven by military needs. Its grid-pattern streets, based on military camp layouts, reflected a focus on efficiency. The straight roads of this new district replaced the winding alleys of the old city. Additionally, the roads surrounding the city began to change due to military purposes, with new roads designed for vehicle traffic. These developments signaled the coming transformation of urban streets from pedestrian-oriented spaces to streets dominated by vehicles. Indeed, it was through the repair and construction of these new roads that public buses began operating between Xigong and the old city, as well as between nearby counties.

However, roads capable of accommodating motor vehicles were primarily located outside the old city. According to the *Shengjing Times*,

“The only vehicles seen in the streets of Luoyang were rickshaws, and automobiles were used for long-distance travel, not within the city walls. (“Luoyang gudu fucheng zhengzhi zhongxin”, 1932.)”

This was because the old city’s roads were mostly dirt, narrow, and uneven, making them unsuitable for motor vehicles. Instead, rickshaws were the primary mode of transportation, along with animal-powered and hand-pulled carts. The *Shengjing Times* also noted in the article “Living and Traveling After the National Government Moved to Luoyang” that

“...for goods transport, handcarts were common, while donkeys were frequently used by rural travelers, and the wealthy traveled in wheelbarrows. (“Guofu qianluo zhi shi zhu xing,” 1932)”

These descriptions highlight the significant differences in transportation conditions between Xigong and the old city during the Republican period. Although the old city’s roads saw some improvement during this time, progress was slow compared to the rapid changes in Xigong. According to the *Republican Luoyang County Annals*,

“During the reign of Emperor Xuantong of the Qing Dynasty, a dirt road was built from Dongguan to the Train Station. By the early Republic, this road had gradually been paved with gravel, but no sewer system was installed. In the winter of the twenty-second year of the Republic, Special Commissioner Wang Cifu ordered the repair of the main streets and the county street road... and added a central drainage system.”

After the founding of the People’s Republic of China, the city planning for the Jianxi Industrial Zone included a clear modern road system. Following the “linear city” planning principle, a hierarchy of main and secondary roads was established, clearly structuring the city’s spatial layout. The road design not only considered vehicle traffic but also took into account pedestrian needs and slow traffic, integrating urban infrastructure such as utility lines. Compared to traditional streets, which were merely flat spaces, the road system in Jianxi was more three-dimensional, reflecting a systematic infrastructure network that complemented the modern urban form of the industrial zone. This road network was later extended to Xigong and the old city, forming the comprehensive modern road system of

Luoyang. The changes in the city’s streets during the late Qing, Republican, and early People’s Republic of China periods can be seen in the corresponding urban road images (Figure 5-5).

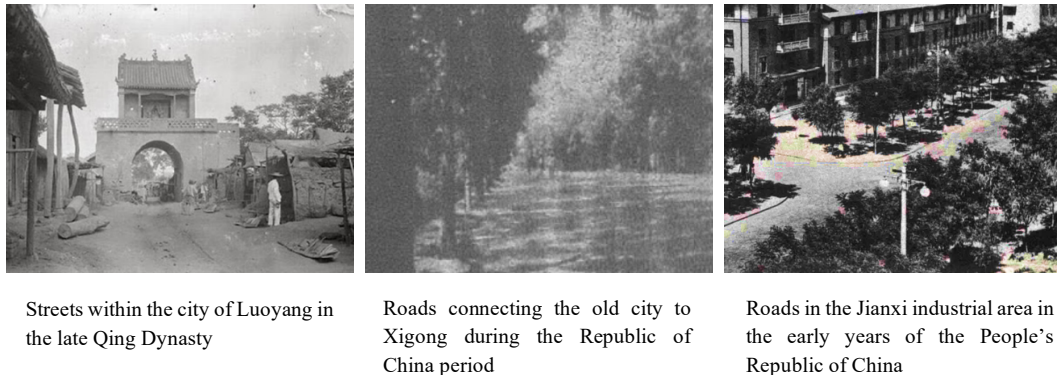


Fig.5-5 The condition of Luoyang’s roads in different historical periods

5.2 Three stages of Luoyang’s urban transformation

The previous section, through a comparison of urban morphological elements, demonstrated the increasing levels of urban modernization from the Old City to Xigong and then to Jianxi, illustrating Luoyang’s transformation from traditional to modern as it moved “from east to west.” However, the degree of transformation in urban morphology and architectural types brought about by the two phases of “building new cities away from the old ones” was not uniform. As seen in the comparison in Table 5-2, the modernization of Luoyang began in the late Qing Dynasty and saw some development during the Republican era, yet the city still failed to establish a comprehensive modern urban planning system, and industrial development remained relatively sluggish. The most fundamental changes occurred after the founding of the People’s Republic of China. Whether in terms of the application of modern planning principles, the transformation of residential settlements, the increasingly diverse types of public buildings, or the more hierarchical street system, all reflect the essential transformation that took place in Luoyang after the founding of the People’s Republic of China.

Based on the above comparison, this section will further analyze the social life behind different urban forms using relevant historical sources, with the aim of more clearly articulating the characteristics of the three phases of Luoyang’s modernization process as represented by the Old City, Xigong, and Jianxi districts. This will help explain the insufficiency of modernization forces in the late Qing and Republican periods, and why the Jianxi Industrial Zone constructed after the

founding of the People’s Republic of China became the fundamental model for modern Luoyang’s reconstruction.

	Old City The historical area	Xigong First expansion area	Jianxi Second Expansion area
Planning Concept	Traditional concepts, rituals, historical influence	Focus on efficiency, single function	Production city, accord with socialist ideology
Residential buildings	Courtyard House, urban residents are mostly an elite group	Main buildings are the barracks, the officers’ residence kept the courtyard house layout	Modern residential complex, serving the new families of the industrial era
Public Buildings	Temples and other spaces of religions	Primarily for government use	The types of public buildings are diverse, covering all aspects of people’s lives.
Industrial Architecture	There are almost no industrial buildings, except for the railway locomotive factory outside the city built in late Qing	A power plant in Xigong, and hangers of the aviation school	Heavy industry and Light industry, including machinery manufacturing, metallurgy, and textiles
Public Space	Streets serve as public spaces	Converted former temples into parks and vacant land into sports fields	Parks and squares were constructed serves as highly political spaces.
Road network	A road system primarily for pedestrians	Formed according to the layout of the military camp	Main roads and secondary roads were delineated, separating fast and slow traffic.
Characteristics of Urban Development Stages	Some modern elements have emerged, but the city still largely remains in a pre-modern state	Infrastructure has improved to some extent, but it primarily focuses on military development, with limited impact on the general population’s daily life	Based on the concept of a modern industrial city, the reshaping of urban space and urban life laid the foundation for a modern city

Tab. 5-2 Urban form and morphological elements of the Old City area during the Late Qing Dynasty, the Xigong area during the Republic of China, and the Jianxi area in the early years after the founding of the People’s Republic of China.

5.2.1 The characteristic of urban transformation in late Qing Dynasty

5.2.1.1 Limited self-improvement influenced by the late Qing Dynasty

Since the British invasion in 1840, the Qing government was forced to initiate various reform movements under external pressure, in an attempt to save the dynasty from collapse. The Qing government undertook three major reform efforts

before its demise. The first was the Self-Strengthening Movement (洋务运动), driven by reformist officials who sought to “learn from the barbarians to defeat the barbarians (师夷长技以制夷).” The second was the Hundred Days’ Reform (戊戌变法) initiated by the reformists after the defeat in the Sino-Japanese War. The third and final attempt was the Late Qing Reforms (清末新政), implemented after the invasion by the Eight-Nation Alliance, aiming for comprehensive social reform to strengthen the state.

In these three reform movements, the Qing court increasingly emphasized the importance of industry and commerce, leading to the development of military-related enterprises and various nationalist capitalist industries. Whether motivated by the ruling class’s desire for self-preservation or the interests of the broader gentry class, these early industrial developments undeniably contributed to urbanization and modernization in China. Between 1843 and 1893, the urban population in China grew from 20.27 million to 23.51 million, and the proportion of the urban population increased from 5.1% to 6% (Song, 2009, pp.15-21).

Although urban development progressed, the imbalance between regions and cities became even more pronounced—cities along the coast and major rivers flourished, becoming hubs of industrial and commercial activity. These cities were influenced by the Western world, particularly in the foreign concessions, where modern infrastructure was introduced, and modern urban management systems began to take shape.

Luoyang, located deep in the central plains, was less affected by the technological and cultural impact of Western powers since 1840 and remained predominantly an agrarian economy. Compared to cities like Guangzhou, Shanghai, and Chongqing, which had embarked on the path of modernization earlier, Luoyang still retained its traditional urban morphology. There were no significant changes in either industrial and commercial development or urban management.

If we consider the improvement of municipal governance and the emergence of public services as markers of urban modernization, Luoyang’s modernization process might be traced back to the Late Qing Reforms. In 1901, after the Boxer Rebellion (义和团运动), the Qing government initiated reforms across various fields such as administration, military, judiciary, and education, aiming to advance the nation’s modernization. Compared to the earlier, regionally limited reforms in response to foreign invasions, the Late Qing Reforms had a more direct and widespread impact across the nation.

After the Late Qing Reforms were implemented, Luoyang began to experience changes in urban management. It shifted from a monolithic local governance structure to a more specialized and bureaucratic system, with corresponding reforms in commerce, education, and the judiciary.

Chronologically, the impact of the Late Qing Reforms on Luoyang can be summarized as follows. First, in the field of education, in September 1901, the Qing government issued an imperial edict calling for the establishment of new schools, converting traditional academies into elementary, middle, and higher schools (Wang, 2006, pp.279-283),

“... all existing academies in provincial capitals should be converted into higher schools, all prefectures and counties should establish middle schools, and more nurseries should be set up. (Zhu,1958, p.4719)”

In January 1905, Xu Renlin, the county magistrate of Luoyang, founded Luoyang County Higher Elementary School on the site of the former Zhounan Academy (Jiang, 2013). Later that year, the Qing government formally issued an imperial decree abolishing the traditional civil service examinations, stating,

“From the Bingshen year onwards, all provincial and county-level examinations shall be suspended...(“Tingba keju zhao,” n.d.)”

By the end of the year, the government had established the Ministry of Education (学部) to oversee the establishment of primary, secondary, higher, and technical schools nationwide.

In the commercial sector, under external influence, the Qing government decided to promote commerce. One of the reforms was the establishment of “Encouragement Markets” (markets for promoting industrial and commercial activities) in major cities, as well as the issuance of the “Merchant Code,” requiring local officials to organize chambers of commerce to further develop industry and commerce in various regions. In response, Luoyang established the “Luoyang County Chamber of Commerce” in 1907, serving as a link between merchants and the government (Huang, 2018, pp.154-157). This widespread development of commerce and the formation of chambers of commerce suggested a gradual shift away from the longstanding policy of prioritizing agriculture over commerce.

In the judiciary, the Late Qing Reforms called for the establishment of modern police systems. Chen Kuilong, the governor of Henan, wrote to the Qing government, pointing out that “the province of Henan, being a crucial transportation hub, requires an effective police system to protect merchants and civilians. (Zhang, 2015, p.138)” In September 1905, the Qing government established the Ministry of Police (巡警部), instructing local authorities to establish police departments, and set 1910 as the deadline for the establishment of police forces in all prefectures, subprefectures, and counties. According to the “Old City Chronicles,” Luoyang established its police department on the third day of the first lunar month in 1910, marking the introduction of the modern police system in Luoyang.

Despite these reforms in education, commerce, and public safety, the city’s urban landscape remained largely unchanged. There were no signs of modern innovations like electric lights, streetcars, or Western-style buildings, which had appeared in coastal cities. The new social institutions did not result in new architectural forms that would alter the urban fabric. In fact, local implementation of the Late Qing Reforms often fell short of expectations. For example, in the organization of the Henan New Army during the late Qing period, it became apparent that the modern institutions were mostly modern in name only, lacking the trained personnel to make them effective. Furthermore, disparities in local financial resources and reform ideologies meant that the execution of these reforms varied widely (Peng, 2016, pp.47-97). From this perspective, the impact of the Late Qing Reforms was limited. Often, the reforms seemed to be implemented to meet formal requirements rather than to embrace the true intent behind the new institutions and measures.

Late Qing officials may have recognized that modernization was an inevitable process, but they lacked a systematic and clear understanding of what that entailed. Meanwhile, after years of internal and external strife, the nation was in disarray, leaving little room for effective responses to these reforms. As a result, Luoyang during the late Qing period was unable to drive significant modernization efforts, let alone adopt modern urban planning and architectural design principles that would follow the idea of form follows function.

5.2.1.2 Modernization at the material level and its limited impact

If the measures of the Late Qing Reform had limited influence on the modernization of Luoyang, making it difficult to clearly mark them as the beginning of modernization, then the material level of modernization — the construction of

the Luoyang-Kaifeng Railway — might serve as a better indicator of Luoyang’s entry into the modern age, much like how the rise of military industries during the Self-Strengthening Movement marked early industrialization.

Since the emergence of railroads in Britain in the early 19th century, they were quickly embraced by countries like France, Germany, the United States, and Russia. Railroads revolutionized traditional transportation methods and opened up new possibilities for economic development. In the 1860s, railroads were introduced to China under the impetus of Western powers, initially bearing the flavor of forced imposition, and later becoming tools for foreign powers to extract resources from China (Guo, 2015, p.2). However, as a novel technology, railway construction during the late Qing dynasty often carried multiple meanings — not only as a mode of transportation but also as a battleground for the Qing court and foreign powers to compete. While symbolizing modernity, it also carried strong political overtones (Guo, 2015, p.2).

By the time of the Late Qing Reform, the Qing rulers had come to see railways as the “lifeblood of national development.” For local areas, railways brought convenient transportation and promoted commercial activities, with their advantages gradually being recognized. As a result, the Qing government sought to reclaim control over railway concessions to resist foreign economic encroachment, aiming to mitigate the domestic national crisis (Zhu, 2013, pp.44-57).

In this context, the construction of the Luoyang-Kaifeng Railway, a branch of the Beijing-Hankou Railway and part of the future Longhai Railway, was placed on the agenda. The Luoyang-Kaifeng Railway was also part of the Qing’s strategy to “build branch lines to safeguard main lines (建设支路, 保干路),” which aimed to strengthen control over railway infrastructure and regain leverage in negotiating railway concessions. In November 1903, Sheng Xuanhuai, the Qing official in charge of the China Railway Company, signed the “Luoyang-Kaifeng Railway Loan Agreement” and the “Luoyang-Kaifeng Railway Operation Agreement” with Belgian representatives in Shanghai. By April 1907, surveying work for the Luoyang-Kaifeng Railway had begun. By the end of 1909, the entire 184-kilometer line was completed, and it officially opened on January 1, 1910. Along with the railway, telegraph lines were also established between Luoyang, Kaifeng, and Zhengzhou.

The Luoyang-Kaifeng Railway not only brought modern transportation to Luoyang but also prompted changes in the city’s spatial structure. The construction

of Henan Station and Luoyang Station in the northern part of the city directly influenced the development of the northern area. The railway provided new transportation options for the movement of people and goods, leading to the development of the previously underdeveloped Beiguan (North Gate) area. Furthermore, as an inland city, Luoyang gained the ability to connect rapidly with broader regions through the railway. Through the Luoyang-Kaifeng Railway's connection to the Beijing-Hankou Railway, the city was linked north to Beijing and south to Wuhan. Additionally, shortly after the completion of the Luoyang-Kaifeng Railway, plans were made to extend the line east and west. In August 1910, construction began on the Luoyang-Tongguan Railway, connecting Luoyang to Shaanxi and further expanding the areas accessible by rail from Luoyang.

Although the benefits of the Luoyang-Kaifeng Railway did not immediately materialize after its opening—its freight rates failed to show a competitive advantage, and goods were still predominantly transported by land—the convenience provided by the railway offered significant military value. Combined with Luoyang's geographical advantages, this further emphasized Luoyang's strategic significance as a critical node between the Guanzhong region and the North China Plain.

In conclusion, the modernization of Luoyang during the late Qing period primarily stemmed from the implementation of the Qing government's self-reform initiatives. However, these reforms, which were arguably more symbolic than substantive, did not fundamentally transform Luoyang's pre-modern condition, nor did they bring significant changes to the city's traditional urban form. By contrast, the material aspect of modernization—marked by the opening of the Luoyang-Kaifeng Railway—appears to warrant greater attention. This is not only because of the extraordinary significance of railways during the late Qing period but also because the railway highlighted Luoyang's developmental potential. In the Republican era, the transportation convenience brought by the railway, combined with Luoyang's geographical advantages and rich historical and cultural heritage, attracted both warlord powers and the National Government. This advanced the city's modernization process and laid the groundwork for Luoyang's transformation into a regional military and political center during the Republican period. The characteristics of Luoyang's urban transformation during this period can be summarized as a limited response to the Qing government's self-reform efforts.

5.2.2 The characteristic of urban transformation in Republican era

5.2.2.1 Lack of comprehensive urban planning

From the perspective of its construction background, it is difficult to say that the Xigong area was built to promote urban modernization. Starting in 1914, whether it was under the plans of Yuan Shikai or the expansions by Wu Peifu, their primary goal was simply to strengthen their military positions in their divided territories. These expansion efforts by local warlords were no different from the efforts of late Qing provincial governors to consolidate their own power. As the Qing Dynasty faced continuous defeats by foreign powers and its traditional military forces decayed, the central government lost control over local forces, gradually forming a Localized Centralism, which persisted into the Republican period.

According to Li Huaiyin, under this Localized Centralism, regional warlords strengthened infrastructure and cultivated efficient bureaucrats. However, these developments were not intended to serve the public but to consolidate their own power, enhancing their ability to compete with rival factions.

The development of Xigong in Luoyang was similarly a product of Localized Centralism. The construction of Xigong, aimed at military modernization, was focused on the warlords' own power rather than on improving the city's industrial structure or enhancing the lives of its residents. This fundamental orientation determined the distorted nature of urban construction at this stage, inevitably leading to a divide in urban forms and social life between the Old City and the newly built Xigong.

The departure of warlords often led to stagnation in urban development, with existing modern facilities sometimes falling into disuse. For instance, after Wu Peifu lost power and left Luoyang in 1924, not only did large-scale construction cease, but even the repair of the Tianjin Bridge was abandoned. The electric company promoted by Wu Peifu went bankrupt in 1925 due to severe financial losses, and residents were forced to revert to using kerosene lamps after the brief introduction of electricity (Song, 2021, p.9).

Furthermore, the continuous wars that plagued the region created an unstable environment that further limited Luoyang's development. Wu Peifu was able to establish his base in Luoyang in 1920 after expelling the Anhui warlord Xu Shuzheng's troops from the Xigong area. However, after Wu's defeat in the Zhili-

Fengtian War in late 1924, the city repeatedly changed hands as various warlords fought for control. The frequent conflicts worsened the conditions for the local population, and the city's infrastructure could not be properly maintained.

It was not until 1932, with the Nationalist Government's relocation of the capital to Luoyang, that the stagnation in urban development began to change slightly. Although Luoyang experienced the "Golden Decade" under the Nationalist Government, in terms of urban development, there were no detailed plans such as the "Capital Plan" or the "Greater Guilin Plan." As a result, in Ni Xiying's account, the only modern aspects of Luoyang were found in the grid layout, lush greenery, and serene environment of Xigong, while the general public's living conditions remained largely unchanged.

At a deeper level, the lack of comprehensive urban planning was a nationwide issue. At the time, the Nationalist Government had limited control over local regions and lacked the financial resources necessary to drive the country's industrialization. Even Luoyang, despite its status as a "provisional capital," was no exception. A telling example is the government's struggle to build a power plant in Luoyang.

In March 1932, the Nationalist Government planned to fund the construction of a "provisional capital power plant," but due to financial constraints, the project was delayed. A report on the postponement explained: "With the return of the capital to Nanjing, the need for electricity in Luoyang decreased, and the national treasury was strained, making it difficult to fund non-urgent projects. As a result, the plan to build a power plant in Luoyang was shelved. (Jianshe weiyuanhui, n.d.)" It wasn't until September of the following year, when the Central Military Academy established a branch in Luoyang and offered to help fund the project, that construction resumed.

In summary, the urban construction initiated during the Republican period under the framework of Localized Centralism, focused on military development, did contribute to some degree of modernization in Luoyang. However, the inherent issues of this approach prevented meaningful changes in industrial development and failed to truly benefit the general population. In terms of building types, military barracks were the dominant structures during this period, and the few industrial buildings that were constructed did not significantly alter Luoyang's long-standing agricultural-based economy.

From an urban form perspective, the Republican period failed to create an integrated urban plan for the Xigong and Old City areas, making it difficult for the old and new districts to develop cohesively. The unstable environment further hindered the city's growth, and the arrival of the Second Sino-Japanese War and the subsequent Chinese Civil War inflicted even more damage on Luoyang's urban infrastructure. Luoyang's designation as a "provisional capital" ultimately amounted to little more than an empty title, and all the grand visions for Luoyang's development faded into illusion.

5.2.2.2 Military modernization leading to urban development disparities

Chapters 2 and 3 of this dissertation have discussed the urban forms of the old city and Xigong areas, presenting the differences between the "military" urban form of Xigong and the "traditional" urban form of the Old City. In fact, behind these material spatial differences lie social changes that created further disparities. Through travel notes and newspapers from the Republican era, one can further depict the urban landscape of Luoyang during the first "new city away from the old city" expansion, helping us understand the uneven development between Xigong and the Old City.

In Chapter 9 of Ni Xiyong's book *Luoyang*, titled "A Glimpse of Urban and Rural Life," Luoyang's "city and its suburbs" are divided into five zones:

- (1) Transportation Zone: Beiguan and the area near the train station outside Beiguan
- (2) Cultural Zone: Inside and around Xiguan
- (3) Political Zone: Outside Xiguan near Xigong
- (4) Commercial Zone: The city center and near Nanguan
- (5) Residential and Historical Sites Zone: Near Dongguan (Ni, 1939, p.141)

Among these five zones, except for the "Political Zone" near Xigong outside Xiguan, all belong to the Old City area of Luoyang. Among the detailed descriptions, the "Political Zone" in Xigong stands out as the most modernized urban area.

As early as the time when the Nationalist Government relocated its capital to Luoyang, *Shengjing Times* described the appearance of the Old City of Luoyang:

"The modern Luoyang has become purely an agricultural economy city. Cultural development is lagging behind, with only

four middle schools in the entire city. The only newspapers are the lithographic *Luoyang Daily* published by the County Party Branch and the newly established *Heluo Daily*. Public opinion is virtually non-existent... The initial developments of modern urban facilities, such as cinemas and telephones, are entirely absent... (“Guofu qianluo zhi shi zhu xing”, 1932)”

When Ni Xiyong visited Luoyang, it had already experienced some development as the “provisional capital,” but the Old City still largely lagged behind. In describing Beiguan, Ni Xiyong noted,

“Commerce is not very prosperous, but there are many hotels and transport companies. The facilities in those hotels are very simple, with most of them being converted civilian homes... The appearance of the Luoyang train station is somewhat inferior compared to others; the station buildings date back to the reign of Emperor Guangxu, made of red bricks and tiles, but are in the style of Chinese bungalows. (Ni, 1939, p.131)”

As for the so-called cultural zone of Xiguan, it was named as such because it housed Heluo Middle School and the Zhongyuan Social Education Center, which had been converted from the Zhougong Temple. The latter aimed to “enroll nearby illiterate citizens and provide education. At the same time, it offered various technical training courses, so people could learn to read while engaging in production... (Ni, 1939, p.132)”

In describing the Residential and Historical Sites Zone, Ni Xiyong candidly wrote, “The oldest and most dilapidated part of Luoyang is near Dongguan... The residents of these houses are mostly descendants of prominent families of Luoyang. The architecture of these houses is almost identical... (Ni, 1939, p.133)” With the fall of the Qing Dynasty, the lives of these families gradually fell into decline. The Commercial Zone in the city center and near Nanguan was so named because the former had many shops, and the latter had long been a convenient transportation hub for the exchange of goods. From this perspective, aside from the bustling Beiguan area due to railway development, other areas largely retained their original state.

However, when describing Xigong, Ni Xiyong’s tone becomes much more elaborate:

“Outside Xiguan is the political zone of Xigong. To the north is Luoyang West Station of the Longhai Railway, and to the east, there are avenues leading from Xiguan and Zhougong Temple. Surrounding this area of seven or eight li are densely planted trees, forming a forest garden. Among the lush greenery stand numerous military and political offices. There are more military offices: the Luoyang branch of the Central Military Academy, and barracks for various divisions. Additionally, there is the National Government’s office in Luoyang. The streets are very wide, crisscrossing like a chessboard, with trees growing in clusters on both sides, their fresh green leaves delightful. Beside the crossroads are reservoirs with clear water, reflecting the shade of green trees, adding to the beauty. Occasionally, one or two cars pass by, giving the impression of being in a modern metropolis. (Ni, 1939, pp.132-133)”

Given his comparison of the Old City with Shanghai’s Avenue Joffre in his *Luoyang Travel Notes* in 1935, it is evident how highly Ni Xiyong regarded this newly built area. Thus, the contrast between Xigong and the Old City becomes even more pronounced. In his book, Ni Xiyong compared the two by saying,

“If we compare the appearance of the Old City of Luoyang with the Xigong Square, it is as if they are almost a century apart. The Old City of Luoyang is filled with the ancient and the decaying, while Xigong Square is fresh and bright. It is like comparing an old man to a young one, full of vitality. (Ni, 1939, p.133)”

5.2.2.3 Limited changes in public life

Urban development under a highly militarized and politicized background seemed destined to fail in directly benefiting the daily lives of the general public, the largest group within the city. The modernized urban forms created under such special circumstances were often distorted from the start. This distortion was not only evident in the differences between urban landscapes but also in the daily lives of the citizens.

This kind of distortion was not unique to Luoyang but was a widespread issue in cities across Republican China. As Zhang Jin concluded in her study of Republican-era Chongqing, “In the Republican period, urban modernity and urban

problems were intertwined. Behind the prosperity of cities, there was often distortion. (Li, 2006, pp.292-293)”

This distortion manifested in everyday urban life. The regimented form of Xigong and the traditional form of the Old City corresponded to different lifestyles. In Republican-era Luoyang, modern and traditional lifestyles coexisted, with differences reflected in people’s living environments and occupations. In *Luoyang*, Ni Xiyong categorized and described the different aspects of public life in Republican Luoyang:

Ni Xiyong divided the people living in the city into five groups. The first group was “the lives of government officials, (Ni, 1939, p.142)” which was regarded as “the newest and most noble way of life in Luoyang. (Ni, 1939, p.142)” Most of them lived around Xigong Square. They were key figures in government agencies, with their residences built among the greenery in Xigong Square (Ni, 1939,p. 142). They enjoyed modern housing and lived in a beautiful environment: “Around their residences is a stretch of grass, with flowers of all kinds dotting the greenery...(Ni, 1939, p.143)” Every morning and evening, these officials would stroll around, and in the summer, they could take a car ride for leisure: “It’s cooler outside than indoors, so they drive along the roads of Xigong Square... (Ni, 1939, p.143)” This modern and leisurely lifestyle “was something only the highest-ranking officials in Luoyang could enjoy.” For “ordinary and lower-ranking government officials, their lives were as busy and difficult as ordinary people’s. Although they lived within the Xigong area, they could at most take a walk along the shaded avenues after work. (Ni, 1939, p.144)”

The second group was “the lives of transportation workers and employees.” “Luoyang is a major station on the Longhai Railway, with large locomotive factories and two platforms, east and west. (Ni, 1939, p.144)” Most of these employees rented nearby civilian homes and commuted regularly to work: “They rented houses near the station or factory and followed a routine of going to work on a set schedule. Their lives were tied to the rhythmic movements of machines and wheels, turning into a rigid pattern. (Ni, 1939, p.144)” In their free time, they pursued their own hobbies: “After their shift, their free time began. Each person found different forms of entertainment. Workers went drinking or played cards... while most of the office workers went to the sports field to play ball or strolled in the city center. (Ni, 1939, p.145)”

These first two lifestyles were undoubtedly products of modern society. The first was associated with the new bureaucratic system, in which government officials' living areas extended beyond the traditional yamen³². These officials worked and lived in the modernized Xigong area, which could be compared to Shanghai's Avenue Joffre. The second group consisted of the emerging industrial workforce, who worked in train stations and locomotive factories outside the city. Most of them were migrants, living temporarily in Luoyang and following the work patterns of modern enterprises.

The third group was the "once-prominent families" of Luoyang. "Luoyang has always been a land of culture, producing many talents during the imperial examination era. These families built grand houses and lived comfortably based on their official titles... (Ni, 1939, pp.145-146)" By the Republican period, however, these families had fallen into decline. Although plaques like "Imperial General's Mansion" and "Imperial Deputy Minister's Mansion" still hung over homes in the southern and eastern parts of Luoyang where these families lived, societal changes had made it impossible to maintain their former glory. They often survived by renting out the land inherited from their ancestors to farmers, collecting rent to live on. Others fell into gambling or smoking, resulting in "selling off houses until they became homeless, ending their lives in destitution. (Ni, 1939, p.147)"

The fourth group consisted of farmers. One type of farmer owned their own land and could live off their labor. "Each year, they planted wheat and cotton. The wheat was harvested for the family's food, and the cotton was sold for yearly expenses. During the off-season, they worked odd jobs or ran small businesses to save a little money. Their lives were certainly hard, but they were happy, living by the saying, 'sweat from your brow, food for your mouth, your work, your responsibility.' (Ni, 1939, p.148)" Another type of farmer, however, was the tenant farmer. They often mortgaged their land to landlords to pay for wedding or funeral expenses, and every year they had to provide the landlord with a portion of the grain or pay off debts with interest. "As a result, they worked all year, and after being exploited by landlords, what remained wasn't enough to feed their families. (Ni, 1939, p.148)" Farmers typically lived in villages near the city and were the main population in the smallholder economy. The final group consisted of "cave dwellers"

³² In ancient times, the activities of officials were confined to the yamen. The yamen was not only an office space for officials but also a residential area for them and their aides.

who dug out caves in the terrain around Luoyang to live in. These people were mostly impoverished farmers and laborers.

The latter three groups largely retained their pre-modern lifestyles and did not benefit from Luoyang's urban development during the Republican period. In fact, by the standards of ancient China, only the "once-prominent families" in Ni Xiying's account could be considered "urban residents." In ancient times, cities were symbols of imperial power, and not everyone was entitled to live within the city walls. Those who lived within were usually officials. Without official status, even wealthy merchants could only live outside the city walls (Lu & Ma, 2012, p.85). From this perspective, neither farmers nor cave dwellers could be considered "urban residents." However, by the Republican era, especially after the Nationalist Government relocated its capital to Luoyang, the city's boundaries expanded beyond the city walls, and the group of people defined as "urban residents" also grew.

In context, although Ni Xiying's travel notes might overly praise the lives of government officials and new industrial workers, while perhaps unfairly dismissing "once-prominent families" as idle and unproductive, they do provide a micro-level reflection of societal changes—where the old and new coexisted. Only a minority had adopted modern lifestyles, while the majority still engaged in agricultural work, maintaining traditional ways of life.

During the Republican period, Luoyang's political status continuously improved; however, its urban transformation proceeded at a slow pace. Although the development of the Xigong district partially advanced the modernization of the city and improved its appearance, it also led to an imbalance in urban development, primarily manifested in the stark contrast between the Old City and the Xigong area. Modern facilities and lifestyles were only associated with a small portion of the urban population. In general, the early Republican period saw urban construction driven mainly by military objectives, with little concern for the living conditions of the general public. In the later period, despite becoming the provisional capital, the city still lacked coordinated planning. The industrial structure of the city remained unchanged, and the daily life of the people largely retained a pre-modern character. Against this backdrop, the urban transformation of Luoyang during the Republican period can be summarized as "a limited and distorted transformation driven by military objectives."

5.2.3 The characteristic of urban transformation in the early year of the PRC

5.2.3.1 Reshaping the urban layout

During the Republican period, urban class differentiation and the vast disparities in the lives of the masses were evident. Taking Luoyang as an example, five distinct groups could be identified, with some adopting modern, civilized lifestyles and others maintaining more ancient ways of life. This kind of urban class division became, to some extent, an obstacle to the country's progress toward modernization. The goal of the Chinese Communist Party's leadership in carrying out the New Democratic Revolution (新民主主义革命) was to reverse such class divisions, thereby liberating people from the oppression of the capitalist and landlord classes. This process was also accompanied by the reconstruction of citizen identity and the reshaping of the urban landscape. From this perspective, the liberation of Luoyang in 1948 marked the beginning of the reconstruction of urban social-spatial relations. As Mao Zedong said in a telegram to the front-line command after the liberation of Luoyang,

“The city now belongs to the people, and everything should start from the spirit of the city being managed by the people themselves” (Mao, 1948).”

In 1949, the Communist Party established a new nation led by the working class and the peasantry. In the following years, through socialist transformation, the domestic capitalist and class exploitation systems were eliminated. For the emerging industrial cities that grew during this period, the old exploiting classes disappeared from the city, and they were transformed into self-sustaining workers, with the working class becoming the masters of the city. Under the call of the mass line (群众路线) policy, ‘from the masses, to the masses’ (从群众中来, 到群众中去), the Communist Party's cadres, with a shepherd-like leadership approach,³³ led the masses to actively engage in industrial development and urban construction (Bray, 2005, pp.115).

Additionally, after the founding of the People's Republic of China, the domestic social and economic environment gradually stabilized, providing a

³³ Communist Party cadres guide the masses like shepherds, representing a form of “shepherd-style leadership.” In this leadership approach, cadres are also part of the collective. In leading the flock out of difficulties, they themselves undergo a process of self-redemption.

guarantee for urban development. Compared to the old city of the late Qing dynasty and the Xigong area of the Republican period, the newly developed Jianxi district introduced an important foundation for the development of modern cities—modern industry. The advanced modes of production associated with this naturally created a new demand for urban space. In this context, the belt city planning idea, as the form of industrial city in line with socialist ideals, was applied in Jianxi. Whether it was modern functional zoning, urban industrial structure, new living patterns, new building types, or the clearly layered road systems, the new urban planning aimed to create an efficient system, with the goal of serving the continuously expanding socialist industrialization.

Looking back, neither the Qing Empire's self-saving reforms nor the military-oriented urban development of the Republican era fundamentally addressed the problem of low labor productivity. Luoyang remained entrenched in a traditional society dominated by agriculture. This was not only reflected in the city's urban form but also in the daily lives of its residents. After the establishment of the People's Republic of China, Luoyang's modern urban spatial structure was constructed under the linear city planning model. The city's production-oriented nature not only introduced a new system of efficiency but also indicated that industrial development would drive urban modernization and promote the modernization of daily life..

During the First Five-Year Plan, Luoyang, as a key city, received substantial support from the state in terms of financial, human, and material resources (Hus, 1996, p.901). The Jianxi Industrial Zone, which emerged from the second wave of building new cities away from the old ones, stood as a pioneer, demonstrating the future direction of Luoyang's development in the industrial age. The city's appearance changed dramatically within a short period.

“By the time construction began in September 1955, Luoyang's Jianxi District saw the completion of modern factories such as the Tractor Factory, Mining Machinery Factory, Bearing Factory, and Thermal Power Plant by July 1957. This transformation took only 23 months. Additionally, the Jianxi District established a residential area consisting of 36 neighborhoods, with 425 three- and four-story apartment buildings covering a total construction area of 857,600 square meters. A total of 17,152 households moved into their new homes. Furthermore, eight middle schools, ten primary schools, eight

cinemas, cultural centers, performance halls, three general hospitals, two large comprehensive shopping malls, and two department stores were built, creating a new district of 100,000 residents in Jianxi. (Bray, 2005, p.14)”

In fact, if we strip away the ideological foundations behind urban development, the characteristics of modernization displayed by both Western capitalist countries and socialist states like the Soviet Union share commonalities—namely, the pursuit of social productivity. Whether in residential housing, factories, or even entire cities, economy, rationality, and efficiency were prioritized. Modern scientific production and management methods, such as Fordism and Taylorism, were applied in industrialized nations, including the Soviet Union. From this perspective, post-1949 Luoyang was already on the path toward modern urban development.

More importantly, China developed its own unique approach to social management, creating a replicable spatial model with Chinese characteristics. The blend of traditional and modern features behind this spatial model and its connection to urban form will be discussed in greater detail in Chapter 6.

5.2.3.2 Constructing modern life

The function of a city is to transform people (Mumford, 1961); hence, changes in urban form are often accompanied by a restructuring of the social-spatial relationship. The new urban form of Jianxi Industrial Zone corresponds to a lifestyle aligned with the needs of modern industrial society, symbolizing the cultivation of new citizens in the socialist era.

From 1949 to the completion of the First Five-Year Plan in 1957, the number of workers employed by modern enterprises grew from 1.6 million to 7.9 million, with the proportion of workers in manufacturing increasing from 16% to 55%. By 1958, with the push from the Great Leap Forward, the number of employees in industrial sectors skyrocketed to 23 million (Chang & Zhou, 2021, pp.44-68). The rapid growth of the industrial population and the new identity of urban residents signaled a new lifestyle, which was also reflected in the city’s new form. As Henri Lefebvre observed in *The Production of Space*, “Any society, any mode of production, produces its own space practices. It shapes a space appropriate to itself.” Compared to the Old City and Xigong, the new urban form of Jianxi clearly represented a space conducive to industrial development. It not only aligned with the mission of socialist industrialization but also helped shape a new lifestyle through its spatial characteristics. In this sense, whether consciously or not, the

cities built in the post-1949 era under the motto of “learning from the Soviet Union” embodied strong socialist ideological elements in their planning and architectural design, aimed at fostering a new way of life (byt) to cultivate socialist citizens.

For the workers who formed the core of the city’s population, industrialization facilitated an efficient, modern way of life. The traditional, agricultural lifestyle of working at sunrise and resting at sunset was replaced by a lifestyle based on scientific and industrial rationality, characterized by a clear division between work and life (Ding, 2007, p.136). Industrial enterprises were organized according to assembly line layouts, enhancing productivity and reflecting what Lefebvre described as the “instrumentality of space.” This spatial organization also imposed a form of discipline (Chang & Zhou, 2021, p.51).

In the realm of housing, modern residential designs replaced traditional courtyard houses. These modern homes not only provided a hygienic and healthy living environment but also guided the residents toward a modern way of life through their design. The uniform appearance and similar layouts of the housing estates fostered a sense of equality among the working class. More importantly, housing was treated as a welfare benefit rather than a commodity, and residents could move in by paying only minimal rent.

Furthermore, the improvement of public service systems greatly enhanced and enriched daily life for residents. In their free time outside of work, employees could spend their leisure hours in cultural palaces, recreation rooms, and libraries. The establishment of nurseries and schools at all levels provided education for the children of workers, allowing parents to devote themselves to production work with peace of mind. These children, who received systematic modern education, were also the reserve force for future socialist construction. Additionally, commercial services, healthcare, and other essential services in the city met the daily needs of workers and their families.

These changes in production and living spaces within the new urban form, along with the gradually established public service system, had a direct impact on social life. On one hand, they signaled a transformation of the traditional family structure. In Chinese culture, the family held a central role as the foundation of personal stability, with social interactions confined within kinship networks (Ding, 2007, p.154). Liang Shuming once pointed out, “People criticize the Chinese for knowing only family and not society; in fact, apart from the family, the Chinese have no society. (Liang, 2005, p.16)” The new industrial structures and housing

models that emerged alongside socialist industrialization not only transformed the urban form but also reshaped the traditional family structure. The extended family was replaced by smaller nuclear families dedicated to industrial production. This division of production and life facilitated the creation of new labor traditions, while the public service network provided support for daily life, partially taking over the functions traditionally held by the family, such as child-rearing and elderly care (Ding, 2007, p.156). More importantly, the involvement of social services allowed many women, who had traditionally focused on family duties, to be liberated and participate in socialist construction, thereby realizing their own value.

On the other hand, this transformation also promoted a new lifestyle that combined work and leisure, fostering the development of well-rounded socialist citizens. Buildings such as cultural palaces and clubs, along with newly constructed parks and squares, were designed to provide spaces for leisure activities. This new way of life was even advocated in articles like *Their Happy Sunday* in the *Luoyang Daily*:

“On Saturday evenings, they often danced at the cultural palace. Quite a few young workers enjoyed dancing, but didn’t know how. Zhu Dawen and Zhou Guankun taught them, using a master-apprentice system, where apprentices would teach new learners. Over time, a dozen young men learned to dance... On Sundays, after breakfast, Zhu Dawen practiced painting while Zhou Guankun read thrillers by his side... They always watched a movie or participated in ball games on Sundays. Because their weekends were so enjoyable, they were energized and ready to work on Monday mornings” (Ding, 2007, p.139).

In another article, *Evening at the Cultural Palace*, it was written:

“Some played basketball, some enjoyed the swings, others used the horizontal bars, played chess, or ping-pong... People chose activities based on their interests. Some simply watched others participate” (Ding, 2007, p.139-140).

This somewhat utopian lifestyle was not only the vision for socialist cities but also the ideal goal for the planning and construction of Jianxi Industrial Zone. In terms of urban form, the planning concept of the linear city quickly gave Jianxi the appearance of an industrial city, embodying the spirit of socialist industrialization.

In terms of architectural types, new residential models and functionally aligned public buildings enriched the lives of the citizens.

Thus, the relationship between urban form and social life became mutually reinforcing. The new stage of social development determined the new urban form, and this new urban form aimed to inspire and shape a new way of life. This new way of life, in turn, imposed specific demands on the development of the existing city. Through this reciprocal relationship, the industrial urban form of Jianxi began to extend towards Xigong and the Old City, gradually clarifying the spatial layout of modern Luoyang. From this perspective, regardless of the extent to which this ideal was realized, it significantly transformed traditional urban life, reflecting the changes in urban space and daily life under socialist industrialization. The characteristic of Luoyang's urban transformation during this period can be summarized as the reshaping of the city through socialist industrialization.

5.3 Brief Summary

This chapter explores the process of modern urban development in Luoyang through a comparative analysis of the city's traditional, military, and industrial forms, shaped by two phases of city expansion. The discussion highlights Luoyang's modernizing trajectory from east to west. From the late Qing Dynasty to the early years of the People's Republic of China, Luoyang gradually developed modern urban planning, and its industrial structure shifted, reflecting its transformation into an industrial city. Concurrently, housing, a critical factor influencing urban form, underwent changes that directly impacted the lives of many citizens. Furthermore, the increasing diversity of public buildings, the emergence of public spaces, and the gradual formation of a modern road system indicated that Luoyang was progressively moving away from tradition towards modernity.

While the modernization level of Luoyang during the late Qing and modern periods improved as the city expanded westward—Xigong surpassing the old City, and Jianxi surpassing Xigong—it was not a steadily progressive process, showcase the different characteristic of urban transformation. A comparison of urban form elements reveals that the real transformation occurred after the founding of the People's Republic of China, when the new government reshaped the state, resulting in fundamental changes to the urban form. To gain deeper insights into the societal developments behind these forms, this chapter also draws upon historical sources to discuss the urban transformation during the late Qing, the Republic of China, and the early years of the People's Republic of China. It identifies the limitations of late

Qing self-reforms, the uneven development during the Republican era, and the socialist blueprint established after 1949. This “form-transformation” analysis reinforces the conclusion that the Jianxi Industrial district, created during the second phase of building a new urban area near the old part of the city, became a critical node in Luoyang’s modernization and urban transformation, manifesting in the dual reconstruction of urban form and social life.

The planning and construction of the Jianxi Industrial Zone in the early years of the People’s Republic of China provided a model for the city’s future development. When the industrial area in Jianxi was no longer sufficient for expansion, similar planning models began to extend towards Xigong and the Old City, propelling Luoyang’s “modern reconstruction from west to east.” However, despite Luoyang’s rapid modernization after 1949, modeled after Soviet techniques, this transformation was not merely a replication of the Soviet model. Instead, it incorporated China’s unique characteristics. The next chapter will explore the further development of Luoyang in the late 1950s and examine the distinctive social organization of the *danwei* (danwei), analyzing its influence on the city’s urban form and social significance.

Chapter 6

The Continuity of Urban Transformation and Modern Urban Construction in Luoyang

The previous chapter, through a discussion of the urban form differences between various regions in Luoyang under the two phases of building a new urban area near the old part of the city, highlighted the positive role that the Jianxi Industrial Zone played in reshaping the modern urban landscape and constructing modern life. It represented the ideal industrial city form within Luoyang's development from east to west. This chapter will further explore how Luoyang, in the context of industrialization, achieved a modern reconstruction based on the planning model of the Jianxi area.

The process of reconstruction will be discussed from two perspectives. The first is at the policy level, primarily examining how the concept of the linear city—a socialist ideal for city planning, and the construction of socialist industrialization were further implemented in Luoyang's urban planning as well as specific adjustments made to accommodate local conditions. The second perspective focuses on a unique social organizational and spatial structure in China—the danwei. The danwei functioned not only as the basic unit of industrial production and social management but also as a fundamental unit of urban form. Through the lens of the danwei, the spatial logic of Luoyang's modern reconstruction and characteristics of urban transformation during the socialist era becomes clear, providing deeper insight into the composition of modern Luoyang's urban form and its underlying social significance.

Building on the analysis of these two levels, this chapter will also explore the relationship between modern Luoyang and its traditional roots, both in terms of physical space and analogies in urban form. The aim is to further discuss the connection between Luoyang's modern urban form and its historical city layout,

revealing the continuity that lies behind the seemingly disconnected relationship between modern and traditional forms.

6.1 The Continuing Impact of Policies

To ensure that large-scale industrial projects planned for Luoyang could commence as quickly as possible, after Luoyang was designated as a key city in 1954, the planning of the Jianxi Industrial Zone was prioritized and promptly approved. However, the comprehensive urban planning for the entire city was only completed in 1956, aimed at accommodating Luoyang's rapidly expanding industrial landscape during the upcoming Second Five-Year Plan.

In this overall urban plan, the linear city structure, previously applied in the Jianxi Industrial Zone, was extended further into the Xigong District. This replicable spatial model for industrial cities became the cornerstone of modern Luoyang's urban layout. It not only solidified Luoyang's status as a socialist industrial city but also laid the foundation for the city's urban form and its evolution over the subsequent decades.

6.1.1 The Jianxi industrial area plan as a model

6.1.1.1 Initial “integrating rough and refined” Urban Planning

Due to a lack of adequate urban planning expertise and the absence of thorough surveys on surrounding resources, early urban planning efforts in Luoyang mainly focused on the Jianxi Industrial Zone. This planning primarily involved the detailed drafting of the overall layout of the Jianxi Industrial Zone, while only schematic diagrams were produced for other areas of the city (Li, 2016, p.508) (Figure 6-1).

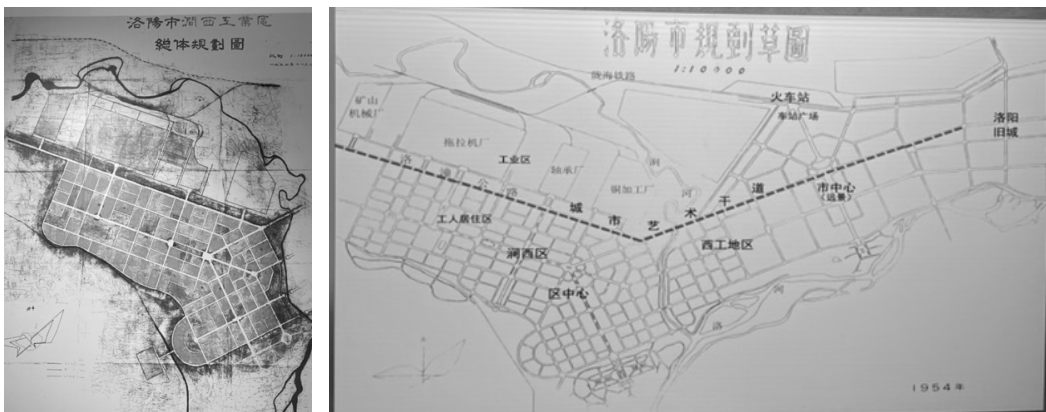


Fig. 6-1 the master plan of Luoyang Jianxi industrial district (left) and the draft plan for Luoyang (right) (Source: Luoyang Planning Exhibition Hall)

On January 8, 1954, the State Planning Commission discussed and approved the joint factory site selection plan for the Luoyang area, which received final approval from Chairman Mao Zedong (Li, 2016, p.507). By October 1954, the Master Plan for Luoyang's Jianxi District (洛阳市涧西区总体规划) was completed, followed by the preliminary design for short-term construction projects such as water supply and drainage, roads, landscaping, electricity, and heating. On November 13, the State Planning Commission and the Construction Commission convened a review meeting, where the planning scheme was approved in principle. On December 17, the Construction Commission formally issued the *Review Comments of the State Construction Commission on the Preliminary Planning of Luoyang's Jianxi Industrial Zone* (Li, 2016, p.508).

The planning and approval process was completed within just two months, highlighting the significance and urgency of the Jianxi Industrial Zone's planning. A comparison of the 1954 Draft Plan for Luoyang (hereafter referred to as the Draft) with the Master Plan for Luoyang's Jianxi District reveals the characteristics of "combining detail and overview" and "integrating rough and refined" in the 1954 Luoyang urban planning.

The Draft covered the old City, Xigong, and Jianxi, clearly outlining the long east-west, narrow north-south linear shape of the city. According to the *Master plan Description for Jianxi Industrial Zone*,

"The western part of Jianxi is a newly constructed area; the old city is a reconstructed area; and Xigong is the future urban land area. Each part has its own architectural planning center, while the overall city center is located in the Xigong District" (Li, 2016, p.227).

The Jianxi District already displayed the spatial structure of a linear city in the Draft, with the production areas of industrial enterprises in the north, arranged along the city's main roads. In the southern part, supporting residential areas were planned. As a transitional zone between the old City and the Jianxi and the envisioned future city center, Xigong adopted a combination of radial and ring road networks, emphasizing urban aesthetics and axis, reflecting a strong European city planning influence and the aesthetic of Stalinist city. Meanwhile, the old city located on the eastern side of the city was not subjected to a complex plan in the Draft, with only a simple schematic of the road network provided. This approach aligns with its role

in the plan as the redevelopment area, meaning the existing buildings would be utilized.

From a historical perspective, large industrial enterprises planned for Luoyang at the time included only “four factories and one station.” As such, the draft plan did not provide clear arrangements for industrial development in Xigong or the Old City, leaving some uncertainty about the future spatial layout of the city.

The *Master plan for Jianxi Industrial Zone* largely followed the spatial layout indicated in the draft plan, further refining the road network structure and defining key building group compositions for squares and city axes.

6.1.1.2 Approval of the Jianxi Plan and its long-term impact

At the end of 1954, the State Construction Commission issued the *Review Comments of the State Construction Commission on the Preliminary Planning of Luoyang’s Jianxi Industrial Zone*, which not only acknowledged Luoyang’s initial urban planning efforts but also set the tone for the city’s future master planning. Three of the directives had a direct influence on later urban planning efforts in Luoyang. These excerpts are as follows:

“The state approves the preliminary plan for the Jianxi District of Luoyang and agrees to develop the area into a mechanical manufacturing industrial zone. Based on the industrial layout and natural conditions of the Jianxi District, the state approves the proposed long-term development scale of the Jianxi District, with a population limit of 150,000 and residential land not exceeding 10 square kilometers... The layout of the district center, streets, squares, and green spaces, the location of industrial railway lines and stations, the principle of allocating building heights, the configuration of water supply and drainage systems, and the connection with the old city are basically feasible. Therefore, the plan is approved in principle as the basis for current external factory projects and the construction of the first residential area, and as a foundation for future comprehensive urban planning.”

“In the near term, Luoyang should focus its efforts on the construction of the Jianxi District, while maintaining the status quo in the old city, except for the repair of major roads connecting

it to Jianxi. The Jianxi District should generally not expand westward toward Gushui Town, but should instead develop eastward, gradually merging with the old city.”

“It is recommended that Luoyang actively prepare for comprehensive urban planning by surveying and mapping potential industrial and residential areas, conducting geological exploration and archaeological research, and collecting and analyzing urban and natural data. When drafting the master plan, the location of the airport should be reasonably arranged. Additionally, priority should be given to factory projects and the construction of the first residential district in Jianxi. If conditions permit, appropriate revisions and supplements to the preliminary planning for Jianxi District should be made.”

The first directive recognized the advanced planning of the Jianxi Industrial Zone, affirmed the layout of streets, squares, and green spaces, and established that the construction of external factories and residential areas would serve as the foundation for future urban planning.

The second directive clarified that future urban expansion should occur eastward, merging Jianxi with the old city, rather than westward toward Gushui Town, which was outside Luoyang’s administrative boundaries³⁴. This decision meant that Xigong District would not only serve as the city’s center but also play an essential role in future industrial development.

The third directive called for Luoyang to actively prepare for overall urban planning while considering the proper arrangement of the airport. The location of the airport, initially rejected in a 1953 site selection plan due to military considerations, was later adjusted in 1954 to accommodate the city’s future development, providing flexibility for comprehensive urban planning.

These directives from the State Construction Commission, combined with plans for industrial projects, clarified Luoyang’s general direction and construction methods. This laid the foundation for the integration of the old and new urban

³⁴ This concept of Luoyang City differs from today’s prefecture-level Luoyang. At that time, Luoyang City was directly governed by Henan Province, while Xin’an County belonged to the Luoyang Special Region. There was no jurisdictional relationship between Luoyang City and the Luoyang Special Region. Later, the Luoyang Special Region was restructured into Luoyang Prefecture, which merged with Luoyang City in the 1980s to form the prefecture-level city.

districts through the planning model established for the Jianxi Industrial Zone, supporting the spatial reconstruction of Luoyang under the linear city framework.

6.1.2 The Important Effects of Socialist Industrialization on Luoyang

6.1.2.1 Industrial Development Promotes Urban Master Plan

After the initial construction of the Jianxi Industrial Zone began, the state once again planned to introduce new industrial sectors to Luoyang. In October 1955, the Ministry of Heavy Industry gathered information on Luoyang, Jiaozuo, and Gong County, all of which were close to fuel and raw material sources, to select a new location for the refractory materials factory that was originally planned for Tangshan. By mid-1956, it was decided that the factory would be constructed in the industrial reserve area south of the Mining Machinery Factory in the Jianxi Industrial Zone (Luonai changzhi bianxie weiyuanhui, n.d.). That same year, the Ministry of Textile Industry's plan to establish a large cotton textile and dyeing factory in Luoyang received approval from the State Planning Commission. In 1956, the state decided to build a glass factory in Luoyang, and around the same time, State-owned Factory 407, originally located in Houma, Shanxi, also decided to relocate to Luoyang.

These new large industrial projects highlighted the growing conflict between industrial development and available urban land. After the locations for the refractory materials plant and the high-speed diesel engine factory were confirmed, the industrial reserve area in Jianxi no longer had enough space to accommodate the other two large industrial enterprises (Figure 6-2). This situation prompted the development of the 1956 "Master plan for Luoyang's Eastern Jianxi District" (also known as the "Master Plan for the Eastern and Western Jianxi Districts")—the city's overall urban planning effort. Building on the experience gained from previous planning, this new plan primarily focused on Xigong District, where the state intended to build two key industrial enterprises: the cotton textile and dyeing factory and the glass manufacturing plant (Li, 2016, p.228).

More than a year after the approval of the Jianxi Industrial Zone plan in late 1954, the plan for the eastern Jianxi District was swiftly put on the agenda and approved, reflecting the priority of socialist industrialization in the national development strategy of early New China. It was this continuous expansion of the

urban industrial layout that drove the rapid formation and improvement of Luoyang's Master plan.

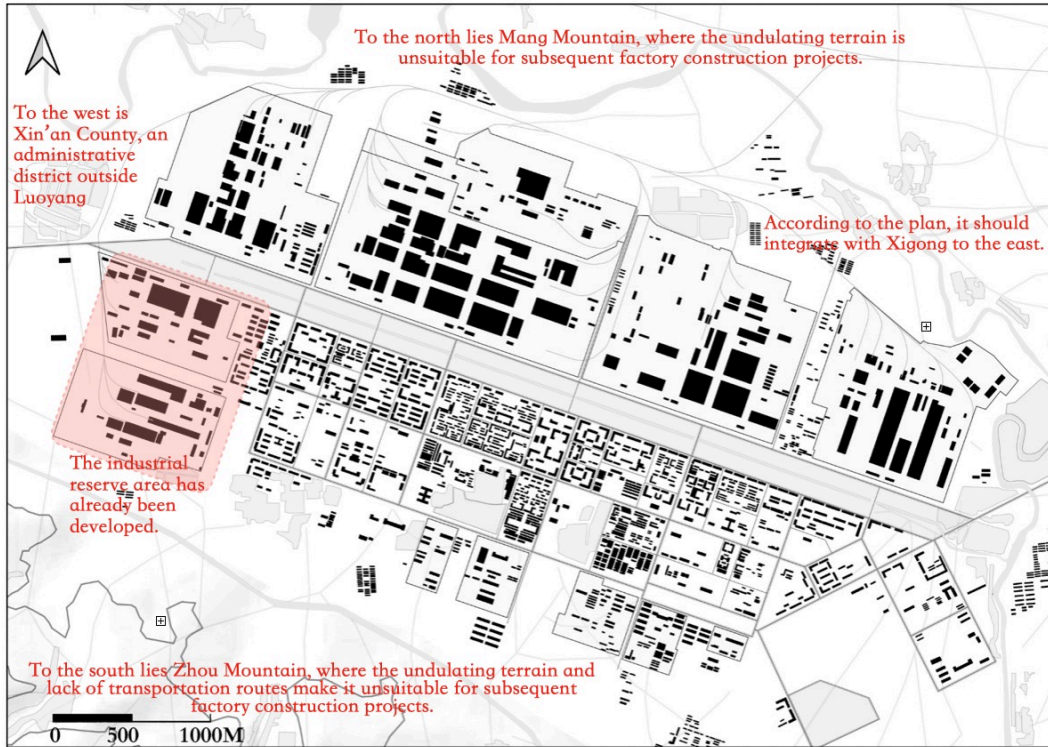


Fig. 6-2 The illustration of industrial enterprises in Jianxi district. Enterprises had been built on reserved industrial area.

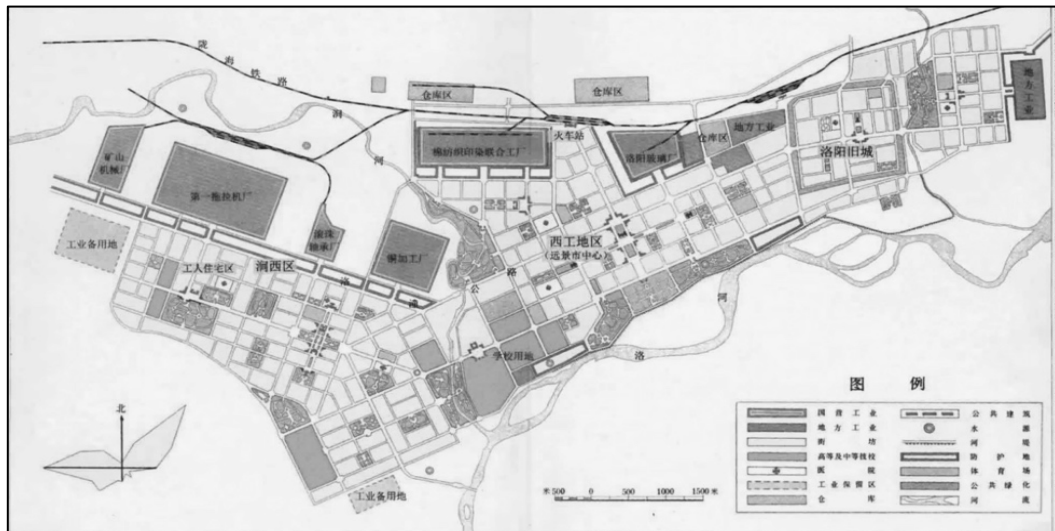


Fig. 6-3 The master plan of the Jiandong and Jianxi district of Luoyang (Source: *BadaZhongdian Chengshi Guihua*)

6.1.2.2 Xigong District's Context-Specific Linear City Structure

A comparison between the 1956 Master Plan for the Eastern and Western Jianxi Districts (Figure 6-3) and the 1954 Draft Plan reveals the most prominent feature to be the clear delineation of industrial land in Xigong District and the more defined city road grid.

In the Master Plan for the Eastern and Western Jianxi Districts of Luoyang, the most striking feature of Xigong District remains the linearly arranged industrial enterprises. As required in the approval of the Master Plan for Luoyang's Jianxi District, the design approach for factory-related projects in Jianxi was extended to Xigong, giving it the characteristic linear city layout—factories of industrial enterprises were set up on the northern side to ensure convenient transportation, while residential areas, including green spaces, squares, commercial, and administrative centers, were located to the south. This linear urban structure, described as “parallel and rolling development of industrial and residential zones,” was regarded as a distinctive feature of Luoyang's urban planning (Li, 2016, p.228).

However, it is apparent that the linear urban form between Jianxi and Xigong was not continuous. Xigong's planning was constrained by additional factors, which can be discussed in terms of the city's existing conditions and prior planning expectations.

From the perspective of the city's existing conditions, unlike Jianxi, the area retained the grid-like road network established by military camps in Xigong before the founding of the People's Republic of China (Figure 6-4), with the new urban main roads cutting through these camps. However, since these camps were still owned by the military, their ownership made it difficult to convert them into factories, preventing the industrial zone in Xigong from being laid out in a straight line along the main city roads as it was in Jianxi.

While existing conditions limited the construction of new industrial zones, Xigong had its own advantages. North of the Xigong barracks was a large area of flat land, some of which was the site of the former airport during the Republican period. Additionally, the Jian River converged with the Luo River at the boundary between Jianxi and Xigong Districts, allowing the industrial zone in Xigong to be placed adjacent to the railway without the need to build a new railway line crossing the river. This was a favorable factor for the construction of new industrial enterprises.

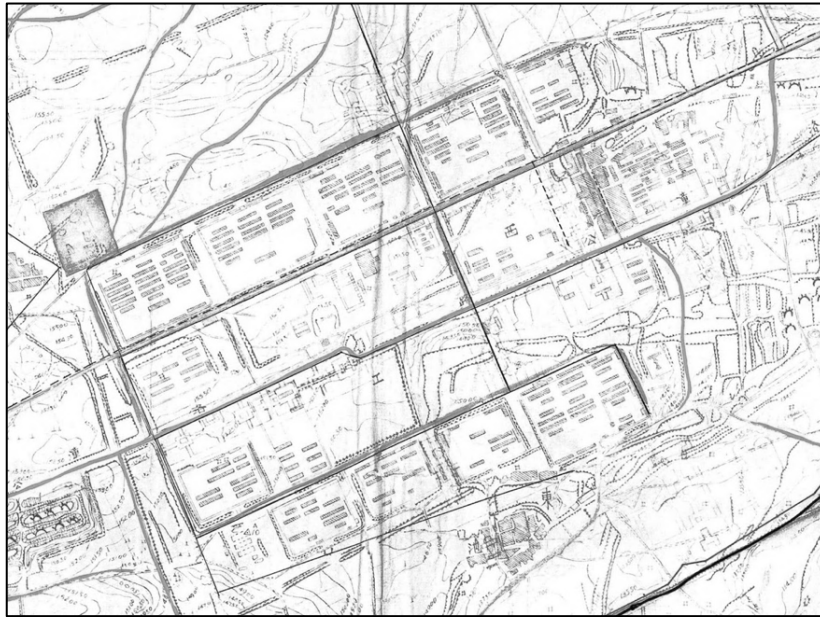


Fig. 6-4 The status map of xigong area in 1956, which also shown the trace of planning road network

Xigong had been defined as the future city center initially. In the Draft Plan, Xigong's road layout was arranged in a radial pattern, emphasizing the artistic composition of urban space. However, with the state's growing emphasis on "frugality," there was a noticeable shift in urban planning, street layout, residential design, and architectural form towards practicality. The pursuit of functional utility surpassed the concern for spatial aesthetics. In the 1956 Master Plan for the Eastern and Western Jianxi Districts of Luoyang, the previous emphasis on the radial road network and urban axis for artistic effect was almost entirely removed. Only one urban axis was retained to align with the earlier vision of Xigong as the city center, along which city administrative buildings, the railway station, and commercial buildings were arranged.

Under the combined influence of these two factors, Xigong once again employed the linear city planning approach, adapting the industrial layout to local conditions and balancing practicality with the creation of artistic space. This highlighted the importance of industrial development in Luoyang's urban construction and reinforced the city's identity as a socialist industrial center. The resulting discontinuity in the spatial structure between Xigong and Jianxi thus became a defining characteristic of modern Luoyang's urban form.

6.1.3 Formation of the modern urban spatial pattern of Luoyang

The 1954 and 1956 regional urban master plans established the modern layout of Luoyang, and the actual development of the city is also worthy of attention. The 1962 “Current Situation Map of Luoyang” (Figure 6-5) (hereinafter referred to as the Current Situation Map) and the 1969 aerial photograph of Luoyang obtained from the United States Geological Survey (USGS) (Figure 6-6) (hereinafter referred to as the Aerial Photograph) provide important references for analyzing the urban development of Luoyang after the founding of the People’s Republic of China.

From the 1962 Current Situation Map, the layout of large industrial enterprises in the city was already clear. The Jianxi Industrial Zone, which was the first to be constructed during the initial stage of the “First Five-Year Plan,” already had six

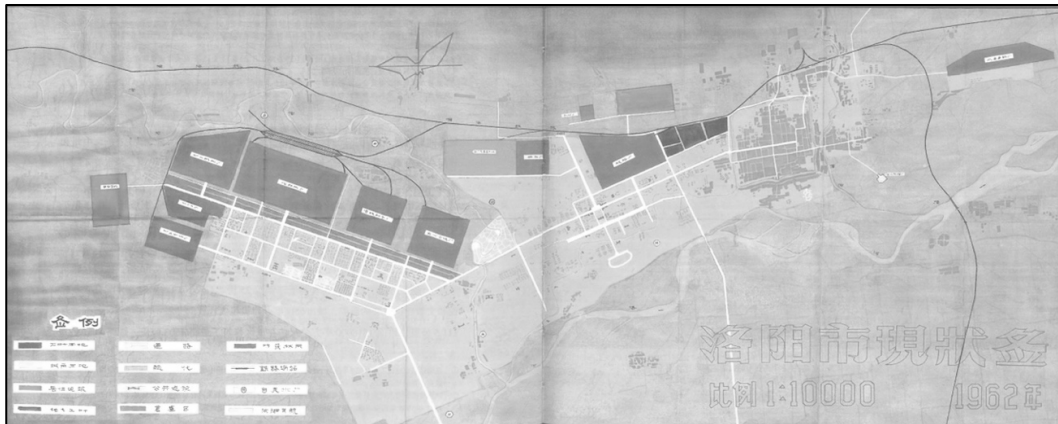


Fig. 6-5 The status map of Luoyang in 1962 (Source: *Bada Zhongdian Chengshi Guihua*)



Fig. 6-6 The aerial photograph of Luoyang, 1969 (Source: USGS official website)

large industrial enterprises (in fact, there were seven, as the location of the First Tractor Factory also included the Luoyang Thermal Power Plant) and one military academy, the Eighth Infantry School (also known as the Luoyang Infantry School).

Comparing the 1962 Current Situation Map with the 1954 Master Plan of the Jianxi Industrial Zone, we can see that the layout of industrial enterprises largely followed the original plan. The city's road network had already taken shape, and the blocks created by the road network, serving as residential areas supporting the industrial enterprises, had also been built. However, as this was part of the early construction phase, only half of the planned residential area was completed—north of the east-west plaza that extended from the eastern part of the Jianxi area. South of this plaza, only scattered buildings were constructed, which were mainly the main buildings of higher education institutions and research institutes closely related to the industrial enterprises.

In terms of new large industrial enterprises, as required by the approval comments for the Jianxi Industrial Zone plan, the area did not expand westward to Xin'an County but instead shifted to the industrial reserve land and the eastern Xigong.

Since the development of the Xigong began late after the founding of the People's Republic of China, the construction of large industrial enterprises in this area also started later. By comparing this with the Aerial Photograph discussed later, it can be inferred that the depiction of the industrial enterprises in the Xigong in the 1962 Current Situation Map was more indicative, and the scale of the land occupied by these enterprises was not represented accurately.

Nevertheless, the Current Situation Map still reveals the development progress of the Xigong—where the former Xigong Barracks had already been integrated into the city. A partially modern road network had formed around it, and the city's main axis had been initially established. Administrative offices and commercial buildings along the axis had also been constructed, showing that a modern urban structure was gradually taking shape. However, for the old City, most of the area was still being utilized and renovated as it was, with only some local industries emerging in the northern part. The overall urban form of the old City remained largely unchanged.

In the 1969 aerial photograph, the framework of Luoyang as an industrial city became even clearer. Significant changes in the construction of research institutes in the Jianxi Industrial Zone indicated that the research support for large industrial

enterprises had become more comprehensive. The road system in the Xigong District was further clarified, and the locations and scales of major industrial enterprises were established, with accompanying residential areas also being developed. The former Xigong Barracks had also found new uses, with a large portion of the area being converted into military-related research institutes, and a small-scale local industry began to emerge in the northern part of the barracks. Additionally, the Old City underwent some changes by 1969, with schools being built on previously vacant land in the northern part of the city, and some factories and schools appearing in the Dongguan area outside the city walls.

The urban development of Luoyang during the 1960s revealed an increasingly clear modern city layout, largely stemming from the planning of the Jianxi Industrial Zone and reflecting a strong socialist ideal of city-building. Under the background of socialist industrialization, it took only a little over a decade for the new and old parts of the city to gradually integrate into the form of a “linear city.” More importantly, as analyzed in Chapter 4, the urban form of the Jianxi Industrial Zone included new residential models, new building types, and a new road system, symbolizing modern life. The promotion of this form represented Luoyang’s fundamental shift towards a modern city.

Overall, the urban development of Luoyang during the 1960s matched its industrial city designation. Whether viewed from the planning map, the current situation map, or the aerial photograph, it is evident that large industrial enterprises dominated the city’s spatial structure, forming a crucial part of modern Luoyang. In addition to this, local industries, research institutes, and government institutions supplemented the city’s spatial arrangement. However, a closer examination of the city’s spatial composition reveals a “cluster” structure—the entire city was made up of various factories and institutions with different functions. They adhered to the overall layout of the linear city while maintaining relative independence. This leads to the discussion of the danwei, a unique social organizational and spatial model in China. The danwei helps to understand the mechanisms and impacts of Luoyang’s urban transformation and reconstruction after 1949 at a more micro level, offering insights into the broader context of modern urban development in China.

6.2 The spatial impact of danwei on Luoyang’s urban transformation and reconstruction

After the founding of the People’s Republic of China, urban construction in China was not a mere replication of the Soviet model. Chinese cities possess

characteristics distinct from those found in the socialist countries of the Soviet Union and Eastern Europe. In studies about these regions, the microdistrict was widely used and became a key element of the urban landscape in socialist countries (Andrusz, Harloe & Szelenyi, 2011). In contrast, China's urban development was shaped by a unique organizational structure known as the danwei. For a long time after the founding of the PRC, the danwei was not only the primary unit of production but also the basic unit of daily life. It was both the organizer of industrial production and the manager of social activities. The integration of the danwei as the foundational element of cities, including Luoyang, with modern urban planning is a defining characteristic of Chinese modern cities.

From this perspective, the analyses presented in Chapter 4 on the spatial form of the Jianxi Industrial Zone, the discussions in Chapter 5 on the functional zoning, residential settlements, and building types in post-1949 Chinese cities, and the interpretation of Luoyang's modern urban spatial structure in the first section of this chapter are all grounded in the framework of the danwei. If the urban planning of post-revolutionary Luoyang provided the skeletal structure for modern urban reconstruction, the danwei can be seen as the "flesh and blood" that filled and supported this framework (Wu & Yu, 2024, p.4).

In this section, the unique social organizational form of the danwei will be further explored in relation to Luoyang's urban form. The aim is to clarify the critical role of the danwei in the modern reconstruction of Luoyang and to uncover the underlying logic that shaped its urban form.

6.2.1 Danwei as a basic spatial unit of the city

6.2.1.1 The Origin of the danwei

The danwei was a social organizational form widely used in China for a long time after the 1950s (Bonino & De Pieri, 2015). Under the system of public ownership, factories, schools, research institutions, and public services all existed in the form of danwei. This organizational form was highly compatible with the planned economy system and carried certain socialist ideals. From an urban perspective, the danwei involved multiple dimensions such as urban space construction and management (Lu, 1989, pp.71-72). As a concept closely related to cities, the danwei was not only an institutional construct but also corresponded to a physical space, making it a cornerstone of modern Chinese urban form (Lu D, 2019, pp.79-91).

Regarding the origin of danwei, various explanations exist in academic circles. Some scholars believe that danwei originated from the revolutionary base areas during the War of Resistance against Japan, where management models combining production and living, along with rationing systems, bore similarities to the characteristics of danwei (Lu, 1989, pp.72-73). Similarly, other scholars associate danwei with the enterprise model of the Republic of China period, pointing out that danwei combined the fiscal system of the Republic of China era and the rural revolutionary base model, while also incorporating the Soviet concept of industrial organization (Lin, 2019, pp.331-334). Additionally, some research attempts to extend the origin of danwei to a broader historical context, associating them with ancient China's ideal of a Great Harmony Society (大同社会) and utopian socialism in Europe (Chen, 2015, pp.63-67; Xiao, Liu, Chai & Zhang, 2020, p.1338).

Although existing studies have not clearly explained the origin of the danwei system, it is widely accepted that the danwei became the basic organizational form of Chinese society during the planned economy era after the founding of the People's Republic of China. Chairman Mao Zedong once said,

“We should further organize ourselves. We must organize the vast majority of the Chinese people into political, military, economic, cultural, and various other organizations, overcoming the disorganized state of old China. (Mao, 1987)”

Through socialist reforms, by 1956, the proportion of public ownership in the national economy, including rural areas, reached 92.4%. In cities, public ownership was the foundation, and almost all working-age urban residents were incorporated into a specific danwei.

In the early years of the People's Republic of China, the state lacked the capacity to fully manage society in terms of manpower and resources. As a result, the danwei model was widely applied to urban construction, industrial production, and other fields. The danwei became a crucial link between national production and social management, acting as an intermediary between the state and individuals, and serving as an agent of state authority in industrial production and social management. Central government policies could be directly transmitted to danwei, which exercised direct control over their employees, thereby creating a simplified power structure that greatly enhanced governmental efficiency.

Although danwei varied in type and size depending on their roles in social production, they all exhibited highly similar spatial characteristics. In “productive cities” like Luoyang, industrial enterprises comprised the majority of danwei. During the First and Second Five-Year Plans, the state established large industrial enterprises in Luoyang, and these danwei, along with their living quarters, dominated the city’s urban space. Smaller light industrial and local industrial enterprises supplemented the heavy industrial sector and also occupied considerable urban space. Additionally, public service danwei and administrative danwei serving industrial production also held an important position in the city. The role of these danwei in shaping Luoyang’s urban form will be analyzed in the next section.

The descriptions above may provide a general idea of the role of danwei in the early urban development of the People’s Republic of China, but they do not fully explain how danwei serve as a framework for understanding the “reconstruction” of modern cities. Therefore, the following section will further discuss the role of danwei in production and daily life.

6.2.1.2 Danwei as basic spatial units of production

(1) Danwei Promoted the Construction of Modern Cities

The development of danwei was closely synchronized with urban development. In the early stages of industrial city construction, local governments primarily played the role of coordinators between danwei. For example, in urban construction, the government was only responsible for land leveling, building city roads, and constructing municipal infrastructure (Bray, 2005, p.142). Except for land leveling, other projects were generally confined to the boundaries of danwei land, with municipal authorities handling only infrastructure outside the danwei, while internal infrastructure was planned and built by the danwei themselves. Consequently, danwei often set up their own construction offices (Lu, 2019, p.181), according to their needs and budgets, developed production, office, and living spaces. These constructions followed urban planning and architectural design standards but were also tailored to the specific circumstances of the danwei. Once the construction was completed, the danwei continued to manage their operations.

This model of urban construction marks a significant difference between industrial cities in China and the Soviet Union. For instance, in the Soviet Union, while enterprises were also responsible for building social housing, they were required to hand over the houses to the municipal government within six months of completion for allocation (Lu D, 2015, pp.36-55). However, in China, both the

construction and distribution of housing were controlled by the danwei. Similarly, in the Soviet Union, welfare services were provided within microdistricts, where residents might not necessarily work at the same place. In China, however, welfare services were also managed directly by the danwei, reflecting a distinct approach to urban construction and management.

(2) Danwei' Role in "Top-Down and Bottom-Up" Production Management

The emergence of danwei simplified social management structures. Production tasks could be directly assigned to the danwei by the central government, and the dependent relationship between workers and their danwei meant that employees had to complete the danwei's production tasks to receive the corresponding welfare benefits. This top-down and bottom-up relationship is crucial to the danwei's role as the basic unit of social production.

From a broader perspective, the danwei system, especially enterprise danwei, formed a vast network of industrial production. Each danwei's completion of its assigned production plan contributed to the country's overall industrial development. The strategic planning of industrial bases and key cities during the early years of the People's Republic of China facilitated the formation of industrial clusters across different regions. Each industrial center specialized based on its location and resources. With the development of transportation networks, these centers could transfer raw materials and products, forming an efficient "state-city-danwei" industrial production system designed to drive national economic development and enhance national strength. This illustrates the "top-down" role of danwei.

For enterprises located in Luoyang, the largest of which was the First Tractor Manufacturing Factory, the site was selected due to Luoyang's location in Henan, a key grain-producing region in China, ensuring that the tractors produced could be quickly utilized. The development of related industries, such as machinery processing and non-ferrous metal manufacturing, also took place in Luoyang. The cooperation between different enterprises improved tractor production efficiency. Products manufactured in Luoyang could meet local needs and be transported nationwide thanks to the city's advantageous transportation infrastructure. Furthermore, Luoyang's strategic location ensured the security of the industrial base.

In addition to fulfilling state production plans, danwei also optimized their internal spatial layout and workforce management to ensure efficient production.

In terms of spatial layout, many large industrial enterprises and research institutes built during the early years of the People's Republic of China were newly constructed, offering considerable freedom in space design. Except for a few highly polluting enterprises, most danwei arranged residential areas near the production zones, creating a balance between work and living. This setup not only met the requirements of an ideal industrial city, but also reduced long commutes for workers (Lu, 2019, p.87), thereby improving work efficiency and lowering energy consumption from commuting. In terms of workforce management, the close dependency between workers and their danwei (Xie, 2019, pp.15-44) meant that employees had to fulfill production tasks in order to receive housing, education, medical care, and other comprehensive benefits provided by the danwei. This arrangement reflects the 'bottom-up' role of danwei, which leads us to their other function in social management, to be discussed next.

6.2.1.3 Danwei as basic units of city management

(1) Danwei and Discipline

After the founding of the People's Republic of China, the new urban forms corresponded with new social structures—modern urban spaces seemed to carry the mission of “cultivating a new industrial-age citizen.” This was also the goal of Soviet socialist urban planning and residential area design.

Danwei played a crucial role in urban construction and social production. They were essential for the emergence of new housing types and architectural forms after the founding of the PRC, and the development of corresponding public service systems also depended on individual danwei. In this sense, the danwei represented not only an efficient production relationship but also a comprehensive organizational framework for modern life. Danwei, combined with the socially driven goals of socialist urban planning and residential models, inevitably played a disciplinary role.

For workers within these danwei, their identities changed compared to before the founding of the PRC. On the one hand, they acquired specialized identities—they were industrial workers, teachers, doctors, or government officials. On the other hand, they were new citizens of socialist cities. Cities were no longer exclusive domains of the wealthy and powerful but were collectively owned by the people. Consequently, the lives of city dwellers also transformed. The new citizens no longer followed the traditional agricultural routine of “working from sunrise to sunset,” but instead adhered to a modern work schedule. Members of danwei had

to follow a series of rules and regulations, and the internal organization of danwei, including different roles, shifts, and job types, ensured the efficient functioning of social production (Chang & Zhou, 2021, pp.50-51).

A similar transformation occurred within families. If the shift from courtyard houses to collective housing signaled a transition from agricultural extended families to industrial nuclear families, the danwei further clarified the roles and responsibilities of each family member. Moreover, it brought countless small families together to form a larger, industrial era “family.” For the former, new residential forms within danwei directly facilitated the transition to modern lifestyles. Public amenities like communal dining halls, bathhouses, and daycare centers saved danwei members time previously spent on household chores, allowing them to fully commit to social production. In this process, women’s roles underwent a fundamental transformation—they were liberated from tedious domestic work and became equal participants in the industrial workforce as new citizens of the modern era (Lu D, 2015, pp.36-55).

Additionally, danwei functioned as self-contained and relatively independent entities, providing all-encompassing care for their members. This created a relationship of dependency between members and their danwei, as members needed the danwei to achieve personal fulfillment (Liu & Zhao, 2000, pp.102-108). The traditional Chinese cultural concept of the ideal life, which revolved around a “person-family-state” relationship, was replaced by a new “person-danwei-state” relationship (Liu & Zhao, 2000, p.105). The large family of industrial society, organized by divisions of labor, replaced the traditional family structure, reshaping both people’s lifestyles and social relationships.

In summary, the danwei system clarified individual identities and transformed family life into a modernized form. Through the organizational model of danwei, combined with the physical space of cities and buildings, individuals were disciplined, and modern lifestyles were promoted on a broad scale.

(2) Danwei and the Maintenance of Social Order

The role of danwei in the social management of modern Chinese cities can be analyzed from two perspectives: within the danwei (danwei members) and outside the danwei (non-members).

Internally, danwei provided both welfare and daily oversight to their employees—a mix of meticulous care and pervasive management. Members of

danwei were required to adhere to danwei rules, could not change jobs easily, and even needed a “letter of introduction” from the danwei to travel between cities. This seamless blend of care and control was possible because, for a long period after the founding of the PRC, most urban residents were affiliated with specific danwei, which provided them with essential services. People worked within their danwei, accepted the danwei’s management, and in return received various welfare benefits.

From the perspective of traditional Chinese culture, this dual role of care and control can be explained further. Traditional society was dominated by “paternalism” and “patriarchal authority,” which was evident even in everyday language—officials were often referred to as “parental officials,” while the populace was called “children of the state.” A similar relationship can be seen between danwei and their members. The danwei held a significant amount of authority, and members had to comply with its rules to promote the danwei’s development, fulfilling social production needs. Despite the presence of traditional elements, the combination of paternalistic authority within the danwei and the Communist Party’s emphasis on equality fostered a sense of belonging and mission within members, encouraging a spirit of dedication.

For those outside the danwei, however, the system was highly exclusionary. In cities, those without affiliation to a specific danwei found it difficult to survive. From this perspective, being a city resident and a danwei member became synonymous, meaning that people were effectively under official control, ensuring urban order during the development process.

Furthermore, danwei, alongside the household registration (hukou) system, became a critical means of managing urban populations. In the late 1950s, as rural collectivization progressed, large numbers of rural residents sought opportunities in cities, putting pressure on the cities’ limited resources (Chen, 2004, pp.102-121). In response, the state imposed strict household registration laws to restrict rural-to-urban migration. This meant that people living in rural areas could only leave by securing formal employment in a danwei. Thanks to the danwei system, China avoided the issues of slums, crime, and homelessness that plagued other countries during urbanization (Lu D, 2015, p.42).

6.2.1.4 Danwei as the basic spatial unit of urban form

Before the 1950s, industrial development in most Chinese cities was limited. Even though cities along the coasts and rivers saw some growth during the late Qing and Republican periods, after the founding of the People’s Republic of China, these

cities were deemed inconsistent with the principles of socialist urban planning. Thus, they required some degree of transformation (Xu & Li, 2016, p.12). The aim was to meet Mao Zedong's mandate that "the cities of New China must serve socialist industrialization. (Sit V, 2021, p.303)"

As a result, new industrial zones were planned not only in established cities like Nanjing, Beijing, and Shanghai but also in emerging industrial centers such as Baotou, Lanzhou, and Luoyang. Because these industrial areas were less affected by existing urban zones, their planning could adhere to the principles of industrial cities, allowing greater freedom in both spatial organization and aesthetic considerations.

The danwei, as the organizing structure for all institutions within the city, had a close relationship with urban planning. From a citywide perspective, in response to the call for socialist industrialization, large industrial enterprises became the central focus of urban planning and directly shaped the city's form. These enterprises occupied significant urban space and were supported by well-connected road and rail systems. If transportation to the site was inadequate, new roads and railway lines would be constructed to facilitate connections (Li, 2016, pp.97-109).

At a more localized level, each danwei could be seen as a self-contained entity (Lu D, 2019, p.81). These enclosed spaces typically consisted of one or more courtyards, which were often surrounded by walls with guarded entrances leading to the city. In this way, danwei within the city formed a series of "compounds (大院)," categorized into "government compounds (政府大院)," "school compounds (学校大院)," or "factory compounds (工厂大院)," depending on the nature of the institution. Thus, the "compound" became the spatial manifestation of the danwei in the urban landscape, where Chinese cities under the danwei system were essentially composed of many interconnected but independent compounds.

In summary, danwei functioned as the basic production and living units, as well as the fundamental units of urban form. These danwei created independent but interrelated compounds throughout the city. At the same time, danwei served as intermediaries between the state and the individual, ensuring the efficiency of social production and the stability of urban development, laying a solid foundation for the modern reconstruction of cities. The following section will return to the case study of Luoyang, analyzing the relationship between danwei and Luoyang's urban form from this perspective.

6.2.2 Modern reconstruction of Luoyang from the perspective of danwei

6.2.2.1 The development of danwei in different areas

(1) Jianxi Area: The Early Emergence of the Danwei Model

As a newly built industrial zone based on the strategy of building a new urban area near the old part of the city, the Jianxi area was the first to clearly demonstrate the important role that the “danwei” played in socialist industrial cities. By the mid-1960s, the construction of the Jianxi Industrial Zone had essentially been completed, which included the “four factories and one station” built during the First Five-Year Plan and two large industrial enterprises added during the Second Five-Year Plan. This formed the basic urban layout of the Jianxi Industrial Zone. In addition to industrial enterprises, a number of supporting research institutes and higher education institutions were developed in succession, forming an overall urban layout consistent with linear city planning (Figure 6-7).



Fig. 6-7 The illustration of the distribution of danwei in Jianxi in early 1960s

From the perspective of danwei, the urban form of the Jianxi Industrial Zone can be more clearly analyzed. Seven large industrial enterprises occupied a

significant portion of the land. Except for the Luoyang Thermal Power Plant, the other enterprises followed a layout that placed the production area adjacent to the residential area, shortening the commuting distance for employees. Besides these large industrial enterprises, the research institutes and higher education institutions adopted similar layouts. Although these institutions were smaller in scale, they presented a similar spatial structure, with work areas and residential areas arranged nearby, creating a series of “danwei compounds.” Due to the large scale of these danwei enterprises, their compounds included not only production areas but also more than one residential area.

Analyzing the diagram, the “linear city” form of the Jianxi Industrial Zone can be further broken down. The area can be seen as composed of interconnected yet independent “islands,” forming an “archipelago.” As a completely new industrial city, Jianxi did not have to consider the influence of existing urban areas on its spatial layout, making the creation of its urban space closer to an idealized, complete form. It could be regarded as a model, and the future industrial layout of Luoyang was based on this model.

(2) Xigong Area: Integration and Reconstruction of New and Old Spaces

In the overall city planning formed at the end of the First Five-Year Plan, the spatial structure of Jianxi was used as a reference for the construction of the Xigong area, where the “danwei” continued to play a central role in shaping the modern urban form.

The former Xigong military camp was repurposed for new functions. A portion in its northwest corner was converted into the Luoyang Central Hospital. The rest of the camp retained military-related functions, with the largest part becoming a military research institute in 1961, while other parts later turned into factories under military control. Although the danwei divided the original military camp area, they maintained some continuity in terms of function.

Outside the existing area, the danwei continued to serve as the basic component of the Xigong area’s urban form, but the types and scales of the danwei differed significantly from those in Jianxi. Xigong contained only two large industrial enterprises, similar in size to those in Jianxi, each with a large production area and several residential blocks. However, most of the enterprises in Xigong were smaller and more varied in type, developing along the northern side of the military camp and the western side of the old city. The scale of these danwei often corresponded to the grid spaces defined by the planned roads of Xigong. Additionally, as Xigong

was designated as the political and commercial center of the city, the area also featured a significant number of large government compounds, adding to the diversity of the danwei types (Figure 6-8).

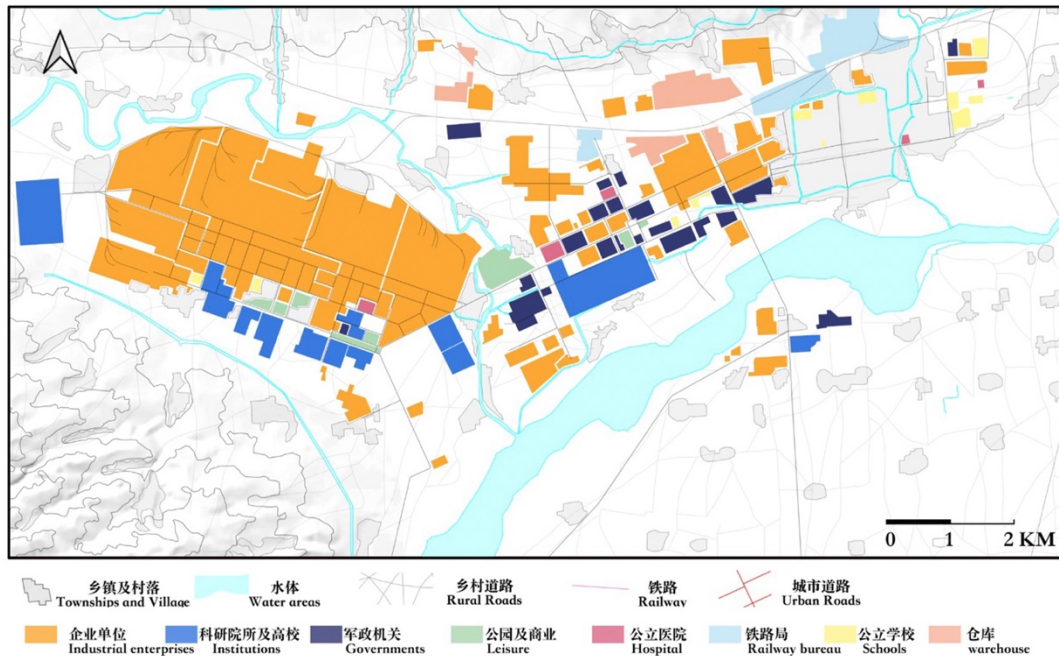


Fig. 6-8 The illustration of the distribution of danwei in Luoyang in early 1960s

(3) The old City: Continuation of Historical Form

Compared to the development of Jianxi and Xigong during two phases of “building a new urban area near the old part of the city,” the old City, was largely expected to maintain the status quo in modern urban development. After the liberation of Luoyang, the Old City played a transitional role in urban construction. For instance, in the early days of the People’s Government in Luoyang, all government offices were located in the Old City. Similarly, during the initial planning stages of the Jianxi Industrial Zone, the preparatory offices of major industrial enterprises were also located in the Old City.

Although the historical landscape of the Old City did not undergo significant transformation after the new urban layout of Luoyang was established, a closer examination of the Old City’s denser southern area and more sparse northern area, as well as the development around the Old City, reveals the influence of the danwei model. Inside the Old City, the northern part, previously undeveloped, became home to several danwei, including two large schools occupying the largest plots.

Around the Old City, new danwei were also established, reflecting the transition between historical and modern forms.

6.2.2.2 Spatial characteristics of Luoyang as a danwei city

(1) Archipelago-like Urban Structure

In the context of “enterprises running society (企业办社会),” large industrial danwei that occupied significant urban space were not only responsible for constructing their production and residential areas, but also for taking care of the daily lives of their members. This created self-sufficient, enclosed spaces. These danwei also shared similar internal organizational structures, typically including departments for housing, education, healthcare, and logistics to manage life-supporting facilities. The comprehensive control over production and living, along with complete supporting facilities, turned these large industrial danwei into “cities within a city” (Bonino & Repellino, 2021, pp.92-99).

In addition to these, smaller danwei such as institutions, administrative danwei, and small factories supplemented the large industrial enterprises. While these smaller danwei were not as comprehensive in function, their organizational and management models were similar.

Under these conditions, each danwei became a self-managed entity, resembling an industrial-age “extended family,” and this social organization model was reflected in the urban form. A series of enclosed “compounds” formed islands within the city, creating an archipelago-like structure (Figure 6-9).

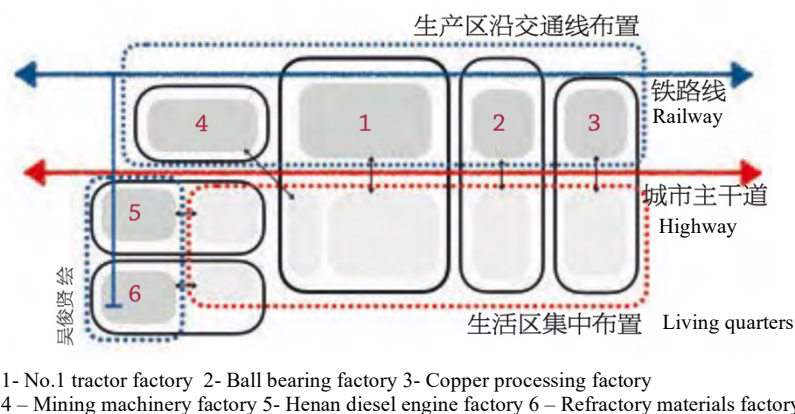


Fig. 6-9 The spatial relationship of large enterprise danwei in Jianxi Industrial District, showing an archipelago-like urban structure

(2) Homogenized Spaces

Compared to the archipelago-like urban structure, the homogenization of danwei spaces represented a secondary characteristic of the city's urban form. After the founding of the People's Republic of China, Luoyang's urban planning largely followed the socialist ideal of a linear city while incorporating the danwei model, a unique Chinese social organization. These two elements did not conflict; rather, the combination of the danwei and modern urban planning principles could be viewed as a defining feature of the industrial cities in New China, including Luoyang.

The similar functions of danwei—organizing production, accommodating workers' lives, and their similar management systems—led to a certain homogeneity in their spatial structures. This homogeneity was not only reflected in the macro-level spatial layout of danwei but also in their internal building types and layout patterns, all of which became determining factors of the city's form.

This homogeneity can be discussed by considering the size of the danwei. Larger danwei, such as the “four factories and one station” in the Luoyang Jianxi Industrial Zone, dominated the city's economic development and had larger scales and more employees. These danwei were key to the city's planning and shaped the urban layout with their regular spatial patterns. For example, the First Tractor Manufacturing Factory had its production space on the northern side and a



Fig. 6-10 The spatial structure of large scale danwei, use the No.1 tractor factory as an example

residential area composed of several “neighborhoods” on the southern side, conforming to the linear city structure of the Jianxi Industrial Zone (Figure 6-10). Smaller danwei, on the other hand, integrated both work and living spaces into a single enclosed area. This led to two abstract models of danwei spatial structures (Figure 6-11), offering a deeper understanding of the internal texture of the archipelago-like city structure.

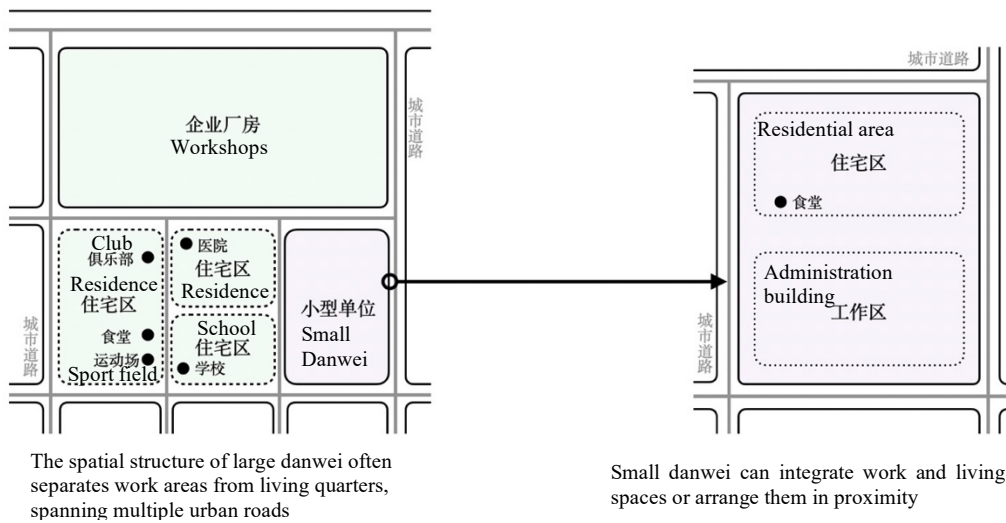


Fig. 6-11 The illustration of large danwei and small danwei

(3) Dominance of Industrial Danwei

A key feature of Luoyang, as a socialist industrial city, was the dominance of industrial enterprises, highlighting its identity as a “production city.”

If color-coded, industrial enterprises would occupy the majority of the urban space (Figure 6-8). These large danwei not only provided the framework for Luoyang’s urban form but also created a considerable number of jobs. With their extensive care for members, the public services provided by these danwei were a significant part of the city’s public service system, contributing to the establishment of Luoyang’s modern public services.

Other institutions in the city could be seen as serving these key national industrial enterprises³⁵. By 1965, Luoyang had 14 independent research and design

³⁵ The “No.1 Tractor Factory” corresponds to the “Luoyang Tractor Research Institute”; the “Luoyang Bearing Factory” corresponds to the “Luoyang Bearing Research Institute”; the “Luoyang Copper Processing Factory” corresponds to the “Luoyang Nonferrous Metal Processing Design Institute”; the “Luoyang Mining Machinery Factory” corresponds to the “Luoyang Mining

institutes, including 8 affiliated with ministries, 1 provincial-level, and 5 city-level institutes (Luoyangshi difangzhi bianzuan weiyuanhui, 2011). This created a “production-research integration” model, underscoring the nation’s commitment to prioritizing heavy industry.

Additionally, outside the large enterprises, the city, districts, and even streets operated small-scale factories, often engaged in light industrial production. Many of these served the city’s daily needs, such as the Luoyang Flour Factory and Luoyang Meat Processing Plant.

Thus, the development and prosperity of Luoyang after the founding of the People’s Republic of China were closely tied to the continued growth of these large industrial enterprises.

6.2.2.3 The growth of Luoyang’s urban form under the danwei system

The urban structure of modern Luoyang, composed of danwei in the 1960s, continued to evolve over the following decades. If we step slightly beyond the time frame of this study, which focuses on the period between 1910 and the 1960s, the role of danwei in the “reconstruction” of modern Luoyang becomes clearer.

Looking at the city’s development, modern Luoyang’s urban growth built upon the structure established in the 1960s. As the large industrial enterprises planned during the First and Second Five-Year Plans began production, Luoyang’s industrial layout became more defined. As a key industrial city in China, additional industrial enterprises moved to Luoyang over the following decades, and the city’s industrial base expanded, driving population growth.

This trend was also reflected in the city’s form, particularly in the expansion of residential areas. The boundaries of the production and residential zones, established during the 1960s for the industrial enterprises and research institutes, became more defined, and the city’s structure became clearer. Some industrial enterprises replaced the temporary housing built during the early stages with multi-story residential complexes to accommodate the growing population, further filling in the urban space under the guidance of danwei.

Machinery Research Institute”; and the “Luoyang Refractory Material Plant” corresponds to the “Luoyang Refractory Material Research Institute.”

In 1978, with the implementation of reform and opening-up policies, urban planning efforts resumed in China. In that year, the National Urban Work Conference (全国城市工作会议) in Beijing called for all cities to “seriously compile and revise master plans and detailed plans based on national economic development plans and local conditions” (Zhou & Gao, 2016, pp.53-57). In October 1980, the National Construction Commission held a national urban planning work conference, summarizing 30 years of urban planning in China and providing guidance for future planning. In this context, Luoyang’s authorities revised the city’s master plan for the second phase (1981-2000), which was approved by the provincial government and implemented on January 24, 1983 (Luoyangshi difangzhi bianzuan weiyuanhui, 2011).

The second phase of urban planning accounted for both Luoyang’s strong industrial foundation and its rich historical culture, defining Luoyang as “an ancient capital with a long history and a socialist industrial city focusing on mechanical industries” (Luoyangshi difangzhi bianzuan weiyuanhui, 2011). In this plan, the city’s layout was expanded based on the existing structure, with the focus on “adjusting the structure and filling in gaps.” For example, a 7.8 square kilometer residential area was added south of the flood control zone in the Jianxi Industrial Zone to provide housing for workers in the area’s industrial and research institutes. At the same time, the early flat housing built during the First Five-Year Plan was

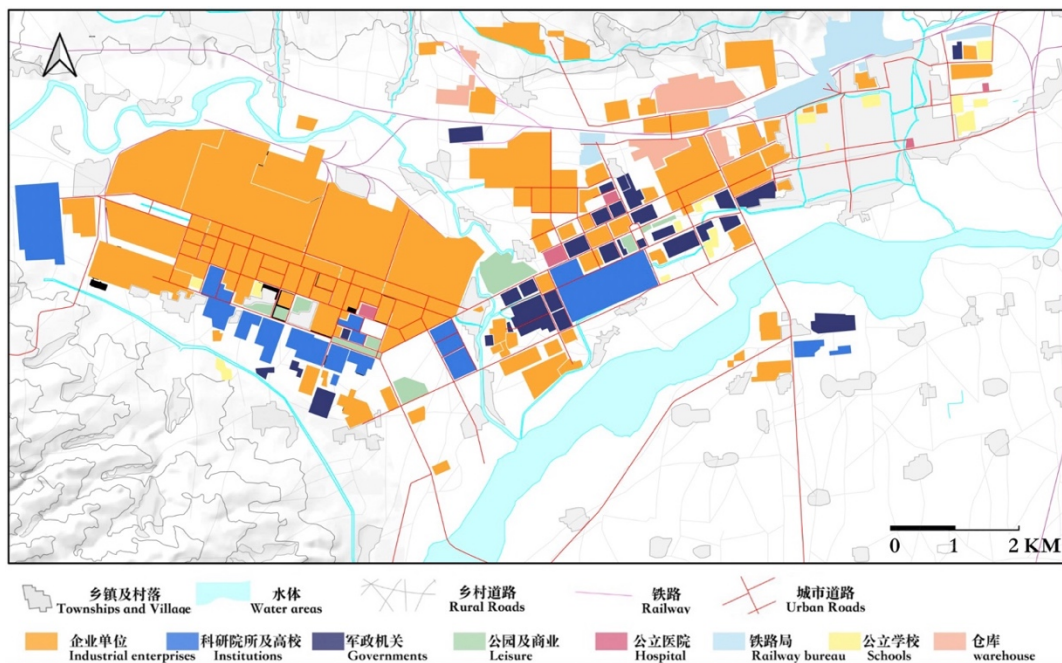


Fig. 6-12 The illustration of the distribution of danwei in Luoyang in early 1980s

renovated. In Xigong, the city center saw the construction of the station and central square, as well as the renovation of the older housing blocks, with several high-rise buildings added. In the Old City, urban renewal efforts focused on developing a commercial center and widening Zhongzhou Road to improve connectivity between the old and new urban areas.

Overall, the second phase of urban planning was an optimization and improvement of the first phase. The city's development remained concentrated north of the Luo River and south of Mang Mountain with the central area in Xigong, supported by the Old City and Jianxi as sub-centers. During this time, danwei continued to play a crucial role in shaping the city's form (Figure 7-12).

6.3 Overlapping and reconstruction of the modern and traditional

Modernity and tradition are not inherently opposing concepts, nor do they represent a “black and white” relationship. When examining the changes in urban morphology, the forms of Luoyang across its three periods appear fragmented, seemingly lacking an evident connection between the modern reconstruction of Luoyang, guided by the danwei system, and its traditional urban form. However, by focusing on physical space and employing comparative analysis, it is possible to uncover continuity between the two. This continuity, in turn, can help us understand the dramatic urban transformations that took place in Luoyang from the 1910s to the 1960s. On a broader scale, this exploration may also offer insights into the development of contemporary Chinese cities.

This section will analyze the overlap between modern and traditional elements on two levels. The first is the physical and explicit overlap, while the second is metaphorical—the continuation of traditional urban forms within the danwei system and the reflection of the traditional family-state structure within the danwei.

6.3.1 Continuation of physical space

6.3.1.1 The formation of the temporal structure of Luoyang

In traditional Chinese thought, cities were not seen as the generators of civilization and did not hold a higher status than rural areas. Similarly, Chinese architecture did not pursue permanence, as wood was long the primary construction material, which was neither fire-resistant nor conducive to long-term preservation.

Within this context, Chinese cities struggled to develop enduring architectural structures that could form temporal frameworks, unlike cities in the West.

This conceptual and material difference is also reflected in the historical form of buildings, making it difficult for contemporary Chinese cities to resemble European cities where it is easy to find centuries-old churches, palaces, and mansions or their ruins. Most of the existing architectural remains in Chinese cities can only be traced back to the Ming and Qing dynasties, which are relatively recent in historical terms. Throughout long periods of social development, while the urban layout remained stable, old buildings were often replaced by new ones for various reasons, leading to urban spaces resembling palimpsests that can be overwritten repeatedly.

Thus, when discussing Luoyang, its connection with the past is more spatial and locational, as in traditional Chinese thought, sacred origins were not derived from material remnants or architectural ruins but were more closely associated with location. As a result, descriptions of Luoyang's rich history, such as "a corner of the Tang Palace," are more often linguistic, with little direct material evidence to corroborate these accounts.

This phenomenon was recurrent in Luoyang before modern times, as the city continually renewed itself through war and peace. It was not until the late Qing and early Republican periods, under the influence of foreign technologies and culture, that Chinese cities gradually embarked on their modernization processes. As discussed in the previous chapter, Luoyang's urban form also began to change under the tide of modernization. Particularly, after two waves of urban expansion that "built new cities away from the old," the city's form was continually reshaped.

Driven by various historical factors, Luoyang's constantly changing urban morphology became marked by strong imprints of the times. Unlike the previously stable spatial patterns and the palimpsest-like erasability of older urban spaces, the modern urban development, driven by the modernization process, brought new functions, created new spaces, and shaped the temporal structure of Luoyang's cityscape.

6.3.1.2 The continuity of urban historical traces

The clarity of the temporal structure of a city lays a strong foundation for the creation of collective urban memory and the preservation of historical heritage. Luoyang's urban development, which followed the "build new cities away from the

old” model during the Republican and early Socialist periods, unintentionally protected the existing urban areas, thereby preserving the city’s spatial characteristics.

This preservation of historical memory first became evident in the systematic planning of cities after the founding of the People’s Republic of China. Managing the relationship between the new and old city districts became a central focus of planning proposals. Consequently, distinct differences emerged between the appearances of the Xigong, Jianxi, and old city areas.

Even after the founding of the PRC, the city’s spatial structure was reshaped by the principles of “linear city” planning and the organizational model of the “danwei.” However, as previously discussed, this “reconstruction” manifested differently in various regions, and the differences in these forms reflected responses to the city’s historical memory, contributing to the clarification of the city’s temporal structure.

Correspondingly, modern Luoyang’s urban form followed the master planning scheme’s “one main, two secondary” structure, with Xigong serving as the political and economic center, Jianxi as the industrial center, and the old city as the historical center. While each area had different roles, the inertia of historical continuity can still be seen in their urban forms. Excluding the relatively late-built Jianxi district, the Xigong area preserved the spatial layout of the former military camp. Besides the addition of two large industrial enterprises, other plots largely followed the earlier grid structure of the city. The military camp itself was repurposed for military-related institutions, military factories, and research institutes, preserving its original spatial layout. A comparison of aerial and satellite images (Figure 6-13) reveals this continuity.

Similarly, the old city maintained its long-standing spatial stability. Apart from changes due to the construction of major thoroughfares, the old city largely retained its former spatial form. Even though the siheyuan courtyard houses were redistributed during the early years of the People’s Republic, the courtyard fabric remained intact, and the previously established road patterns were preserved. This temporal continuity can also be observed in the aerial and satellite images (Figure 6-14).



Fig. 6-13 The development of the Xigong area after the founding of the People’s Republic of China largely preserved the original urban form



Fig. 6-14 After two phases of urban expansion involving ‘building a new urban area near the old part of the city,’ the old city has still maintained its historical urban form

6.3.2 Continuation and development of characteristics of the traditional urban form

6.3.2.1 Enclosed danwei and enclosed courtyard houses

Enclosure and inwardness were key features of ancient Chinese cities. In traditional Chinese urban and architectural design, walls were a significant element (Lee-Wong, 2018, pp.108-119). Externally, city walls were the most prominent feature, serving not only as defensive structures but also as symbols of state power (Chang, 1995). Within the city, structures such as government offices and temples—symbols of authority—were not open to the public but enclosed within layers of walls, creating nested courtyards that reinforced the sanctity and mystery of power. Residential areas, often home to those of status and power, were described as “Spacious and deep courtyard estates” (深宅大院), reflecting a similarly

enclosed and inward spatial configuration. From this perspective, ancient Chinese cities represented a closed world, embodying both the urban form and traditional Chinese cosmology. In the case of Luoyang's old city, this form can be characterized as a series of courtyards enclosed within city walls.

After the founding of the People's Republic of China, modern cities were rebuilt under the danwei model. While new planning ideas, residential modes, and building types marked a departure from the traditional walled cities and enclosed residences and government offices, the danwei discussed above suggests that post-1949 cities continued to maintain a degree of enclosure and inwardness. The many danwei compounds in the city can be seen as a continuation of the enclosed, inward-oriented spaces of traditional cities.

This enclosure can be understood on two levels. The first is physical enclosure, where walls surround the entire danwei to create an inward-oriented space. For security and administrative convenience, the best approach was to enclose the entire danwei with walls. However, for large industrial enterprises, such as the First Tractor Factory (Figure 7-10), which included vast production areas and residential zones spanning multiple city streets, this form of enclosure was neither practical nor economically viable. As a result, the wall-enclosed structure was more common in smaller danwei, such as public service institutions and light industrial facilities. Large industrial enterprises often enclosed their production zones, while their residential areas—comprising multiple districts—were open to the city. In a strict sense, these large industrial enterprises were not completely enclosed in the physical sense, which leads to the second layer of enclosure: the management-based enclosure.

As previously mentioned, the danwei was not only the basic unit of social production but also the fundamental unit of social management. Serving as an intermediary between state power and the individual, danwei fulfilled the everyday needs of their members—food, clothing, housing, and transportation—fostering a dependency on the danwei. Simultaneously, danwei became identity markers for individuals, with a paternalistic form of control that encompassed all aspects of life. From this perspective, despite the fact that some danwei residential areas were open to the city, each danwei still functioned as a closed and relatively independent entity, assuming distinct roles, much like the traditional courtyard compounds with different functions within a city.

Additionally, the combination of the danwei and the household registration (hukou, 户口) system created a dual structure between urban and rural areas, forming barriers to free movement between city and countryside (Chen, 2004, p.109). While city walls in ancient China were only periodically closed and did not entirely restrict mobility, the household registration system after the founding of the PRC formed an invisible wall that hindered free movement between urban and rural areas, as well as between cities.

Based on the above, it is possible to draw a comparison between modern Luoyang after 1949 and ancient cities, with the danwei continuing the enclosed and inward-oriented characteristics of traditional Chinese cities. This may represent a continuity within the seemingly disconnected urban forms, offering insight into the deeper continuities underlying urban transformations (Figure 6-15).

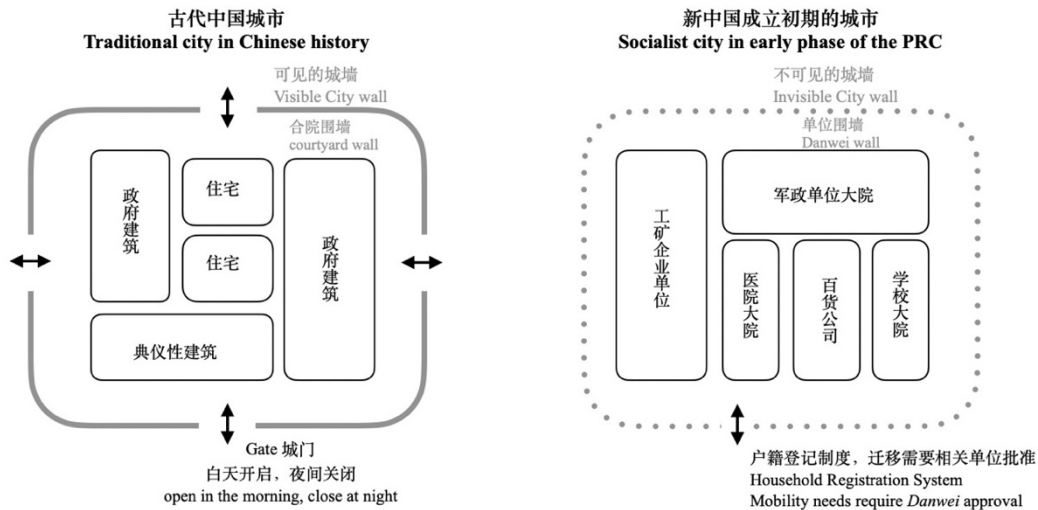


Fig. 6-15 Analogy of urban morphology between danwei city and traditional Chinese city

6.3.2.2 The intrinsic connection between modernity and tradition

From a Western perspective, modernization is often associated with industrialization and urbanization, as well as an emphasis on individualism. However, traditional Chinese thought has long been rooted in collectivism. In recent years, research on East Asian and Confucian modernization has provided new perspectives on modernization, suggesting that the path taken by Western societies is not the only way; different civilizations may have their own unique paths to modernization (Song & Ma, 2022).

This is also true in the development of cities. In the interplay between traditional culture and modern technology, pre-modern and modern concepts are not mutually exclusive; they can coexist and even collaborate. In this sense, the danwei can be seen as an extension of the traditional Chinese concept of “the homology of family and state” (家国同构), which allowed the danwei to remain a basic urban form in China for much of the 20th century, shaping the landscape of modern Chinese cities.

Before discussing the impact of this “the homology of family and state” concept on the development of modern cities, it is necessary to explain the traditional Chinese concept of “family”. According to Confucian thought, unlike the clear and precise notion of “family” in Western culture, which refers specifically to the nuclear family, the traditional Chinese concept of “family” is more flexible, expanding in scope according to an individual’s capacity (Ames & Hall, 1999, pp.208-210). The greater one’s abilities, the greater one’s responsibilities, and thus the larger the “family” one is responsible for. This cultural characteristic makes the concept of “family” in Chinese culture richer and more multidimensional. For the individual, the goal is first to manage a small family, then bring honor to the extended family, and eventually govern the state and contribute to society.

Although the concept of family seemed to disappear in cities after the socialist transformation following the founding of the People’s Republic, the dissolution of large families based on blood and kinship gave rise to new, metaphorical extended families centered on industrial production. This extended family is reflected in the factory or danwei itself, much like the slogan “love the factory as your home” (爱厂如家).

The collective sentiment behind this “the homology of family and state” concept aligns with the collectivist ideals of socialism, allowing individuals in danwei to accept the notion of treating the danwei as a family. This fostered the enthusiasm with which people dedicated themselves to the danwei and the broader project of socialist industrial construction, driving the development of modern Chinese cities.

In this way, the urban form based on danwei in modern China parallels the traditional urban form. The enclosed danwei replaced the family courtyards, and the earlier relationship of “individual-family-state” was replaced by “individual-danwei-state.” In social relations, the danwei replaced the family, continuing the familial characteristics, while in urban form, the danwei replaced the courtyard,

continuing the enclosed, inward-oriented spatial configuration. The comparison between modern and traditional urban forms, as established earlier, is further reinforced by the continuity of the “the homology of family and state” model. This continuity reflects both the distinctive features of China’s modernization process and the characteristics of Chinese modernization itself.

Through discussions on both the physical and metaphorical levels, we can establish a connection between the modern and the traditional. On the physical level, the temporal structure of modern Luoyang’s urban form reveals the characteristics of the city’s evolution. Even as original buildings disappear during urban development, elements like road patterns continue to represent historical continuity. On the metaphorical level, the connection between tradition and modernity reveals that China’s modernization is an ongoing process. While modernity may be evident in urban planning and architectural design, deeper layers of tradition remain intact.

By recognizing this continuity between modern and traditional urban forms, we can conclude that Luoyang’s modernization after 1949 was not an abrupt transformation. Tradition was preserved through spatial organizations like the danwei, which remained dominant until the introduction of market reforms in the post-1978 era. The dissolution of the danwei system marked the disappearance of the city’s enclosed nature, signifying Luoyang’s further movement toward modernity.

6.4 Brief Summary

This chapter approaches the discussion from the perspective of the overall city, examining the long-term impact of urban planning established after the founding of the People’s Republic of China on the development of modern Luoyang. The planning concept of linear city, which originated in the industrial area of Jianxi, was extended to Xigong. Its prominent feature is city planning dominated by industrial enterprises, highlighting Luoyang’s identity as a socialist industrial city.

The danwei is a topic that is often overlooked when discussing the urban form of modern Chinese cities. Although the danwei system gradually dissolved after the reform and opening-up period, it played an indispensable role in production, daily life, and urban construction prior to that.

For this reason, this chapter analyzes the urban transformation and reconstruction of modern Luoyang from the perspectives of linear city planning and the danwei system. It reveals the underlying logic of Luoyang’s urban form through

the lens of the danwei, exploring the relationship between the danwei system and the Jianxi industrial area, as well as how the danwei influenced the development of the old city and Xigong. Furthermore, a brief analysis of urban development after the 1960s further clarifies the role the danwei played in shaping the city's form.

Building on the above discussions, the chapter concludes by establishing continuity between modern and traditional urban forms through the concepts of the temporal structure of the city and the characteristics of the danwei. The temporal structure is reflected in the continuity of urban layouts formed under different historical contexts in the modern industrial spaces of Luoyang, while the enclosed nature of the danwei extends the courtyard-style form that was the basic unit of ancient Chinese cities. On these two levels, the seemingly disconnected development of modern and contemporary Luoyang reveals a sense of continuity. This feature characterizes Luoyang's urban transformation and, to a certain extent, is also present in other Chinese cities.

Conclusion

This dissertation focuses on the city of Luoyang, employing methods from urban morphology, history, historical map interpretation, and interdisciplinary research to discuss the transformation and development of Luoyang's urban form from the 1910s to the 1960s. During nearly half a century, Luoyang transitioned rapidly from a pre-modern agricultural city to a modern industrial one. Behind this swift process were two rounds of urban construction driven by distinct "military" and "industrial" orientations, each characterized by the principle of "building a new urban area near the old part of the city." This unique development resulted in three different urban zones within Luoyang: the old City, Xigong, and Jianxi, all of which are important parts of modern Luoyang but exhibit vastly different urban forms. Based on this feature, the study sorts through historical records from the corresponding period, expands the sources of reference literature, and, using the research framework of "history - urban form - transformation," analyzes the morphological causes and elements of these distinct urban zones shaped by the two instances of new city construction, at various scales. On this basis, the dissertation clarifies the evolution of modern Luoyang's urban form and, through a comparative analysis of the morphological differences between these zones, explores the history of Luoyang's urban and social development during the modern period. The main conclusions of this study are as follows:

(1) The two rounds of "building a new city away from the old one" are key features of modern Luoyang's urban development. They correspond to specific historical contexts of national development and led to the morphological discontinuities that form the historical memory of Luoyang's modern urban evolution.

Late Qing Luoyang, while spatially related to the Sui-Tang Luoyang, was essentially a reconstruction from the Jin dynasty. After the Song dynasty, Luoyang's political status declined, and like many ancient Chinese cities, its urban form remained stable for nearly 700 years. In the late Qing and early Republic periods, Luoyang, located in the country's hinterland, was largely untouched by foreign cultures, technologies, or economic impacts, and its urban form remained unchanged. During the Republic of China period, Luoyang's strategic location and its long history as a capital made it an attractive location for military forces, which began the first round of new city construction in modern times for military purposes. The newly built Xigong military camp reflected the efficiency needs of a military

city, improving Luoyang's infrastructure and expanding its influence, which peaked during the Nationalist government's relocation to Luoyang in 1932. After the founding of the People's Republic of China, under the context of socialist industrialization, Luoyang became a "key city," and industrial development spurred the second round of city construction, applying modern industrial city theories to the new industrial zone of Luoyang. Therefore, within half a century, Luoyang developed two new urban forms—military and industrial—alongside its traditional urban form, forming the foundation of its contemporary urban structure and reflecting the physical projection of its modernization process.

(2) The urban forms of Luoyang in different periods correspond to specific historical contexts, forming coherent structures closely related to historical background, cultural traditions, and industrial patterns, reflecting the social conditions of their time. Three distinct urban forms are identified:

1) The traditional urban form of the Old City during the late Qing period: The Old City of Luoyang, a typical northern Chinese city, was defined by its city walls, which served both as defensive structures and as symbols of power. The city layout within the walls followed ritual requirements, evident in the number of gates and the orientation of ceremonial buildings. The Old City's spatial pattern of being dense in the south and sparse in the north reflected historical and geographical influences. Courtyard-style residences were the key morphological element, shaped by ritual and traditional values. Official buildings, similarly courtyard-style but with more emphasis on ceremonial space, symbolized dynastic power. Streets, which were more of public-like spaces, also played a role in shaping the urban form.

2) The military urban form of Xigong during the Republic of China period: Xigong was developed for military purposes, showing strong characteristics of military urban planning. Its location was strategically chosen near critical transportation nodes, and its spatial layout followed military organization, creating a highly regular structure. The barracks and military command offices, some retaining courtyard forms, were key elements of the urban form, while the expanding road network reflected the area's evolving importance.

3) The industrial urban form of Jianxi during the socialist era: The Jianxi industrial Zone reflected socialist industrialization efforts, embodying the "linear city" concept, which prioritized industrial development. The layout consisted of railways, industrial zones, greenbelts, roads, and residential areas arranged from north to south, creating an efficient urban space. Industrial buildings and residential

blocks were dominant elements, while public buildings and spaces became more diverse as the public service network developed. The road system became more hierarchically structured.

(3) The urban expansion driven by the two rounds of new city construction also reflects the process of morphological transformation, highlighting Luoyang’s “east-to-west modernization.” The comparison of these three urban forms illustrates the city’s transition from an agricultural society to an industrial one, revealing the underlying social changes.

From an overall perspective, the transition from the Old City to Xigong and then to Jianxi illustrates Luoyang’s unique “east-to-west modernization.” In this development sequence, functional zoning became clearer, industrial patterns more defined, and the influence of industrialization on urban development more apparent. In residential settlements, the transition from traditional courtyard-style housing to apartment-style housing reflected the shift from extended families to nuclear families, aligning with modern society’s emphasis on efficiency. Public buildings and spaces, initially absent, became integral parts of urban life, supported by systematic urban planning. Roads also evolved from narrow dirt paths in the Old City to modern, well-structured streets integrated with infrastructure in Jianxi.

These observations reveal that the founding of the People’s Republic of China marked a critical turning point in Luoyang’s urban transformation, driving rapid urban and social development. Historical documents, gazettes, newspapers, and travelogues provide a foundation for analyzing the city’s social changes, allowing for discussions that connect urban form with social transformation. During the late Qing period, Luoyang was in a state of “self-improvement with limited influence,” responding passively to reform policies. In the Republic of China period, development was driven by military and local interests, aimed at stabilizing warlord rule rather than benefiting the general public. It wasn’t until after the founding of the People’s Republic of China, under a stable environment and the push for industrialization, that Luoyang underwent profound changes in both urban form and social life.

(4) Socialist industrialization laid the foundation for Luoyang’s contemporary urban development, starting with the planning and construction of Jianxi Industrial Zone, effectively initiating the “west-to-east reconstruction” of Luoyang’s urban space and social life. Behind this reconstruction lies a connection between urban form and social traditions.

Following the founding of the People's Republic, the master planning of Luoyang integrated the city as a whole, gradually balancing the previously uneven development between the Old City and Xigong, while also fostering the integration of Jianxi, Xigong, and the Old City. This industrialization not only transformed the city's form but also reshaped its industrial structure, population composition, and the daily lives of its citizens, contributing significantly to Luoyang's modern reconstruction.

This reconstruction is evident in the expansion of the "linear city" planning concept applied in the Jianxi district, integrating urban aesthetics with industrial functionality. Additionally, the "danwei" system played a crucial role in both urban form and social management, creating a city structure resembling islands. The danwei system, as a unique social organization under a planned economy, governed all aspects of citizens' lives, helping to understand the logic behind the spatial organization of cities during this period.

Based on the above analysis, this study suggests that the continuity of Luoyang's urban development can be viewed from both physical and metaphorical perspectives. The former mainly manifests in the inheritance of spatial patterns, such as the dense road network and winding alleys of the Old City, as well as the grid-like spatial structure of the Xigong. The latter is reflected in the intangible spatial dimension, where the danwei in the city, as enclosed entities, seem to evoke traditional courtyard houses in ancient cities, sharing characteristics of inwardness and enclosure. From these two aspects, it becomes clear that, behind the seemingly discontinuous urban forms of Luoyang, a stable temporal structure has emerged over time, and this temporal structure has been sustained in the city's subsequent development. Furthermore, the traditions of ancient urban space such as inwardness and walled city have also been preserved in the reconstruction of the modern city.

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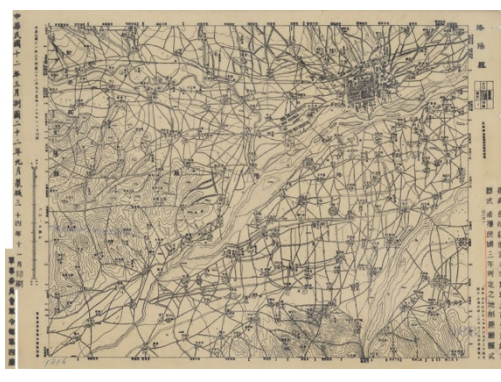
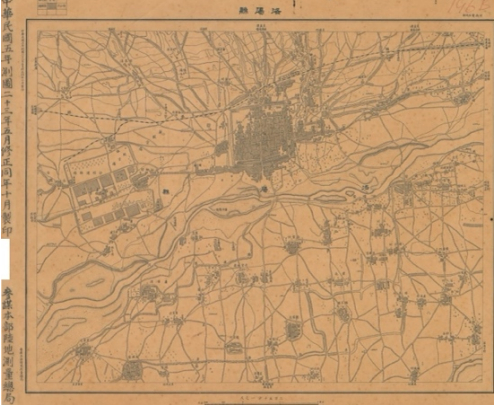
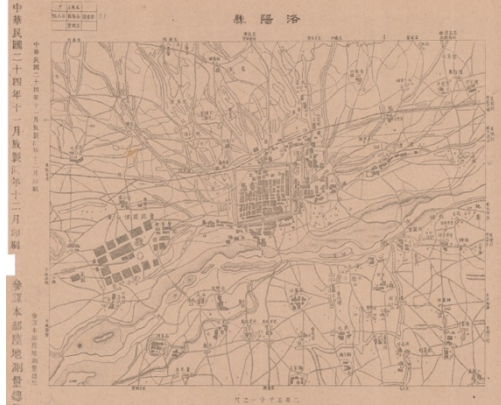
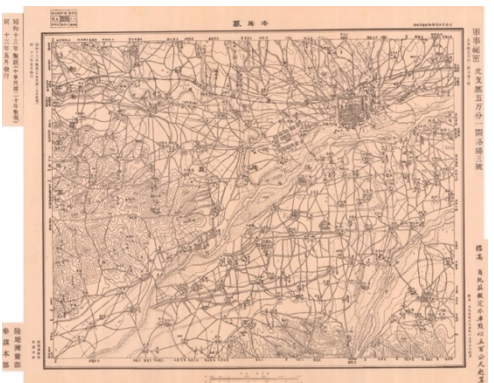
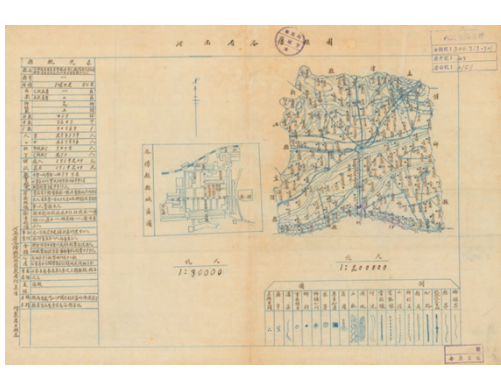
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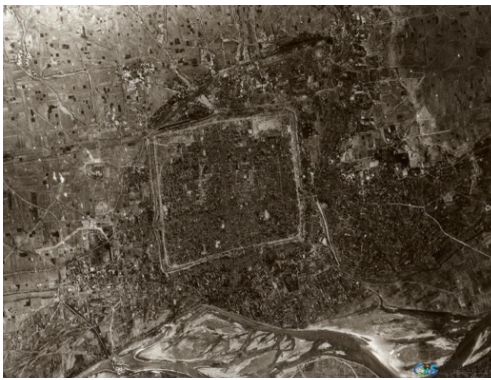



Appendix A: Maps of Luoyang

Ming and Qing Dynasties

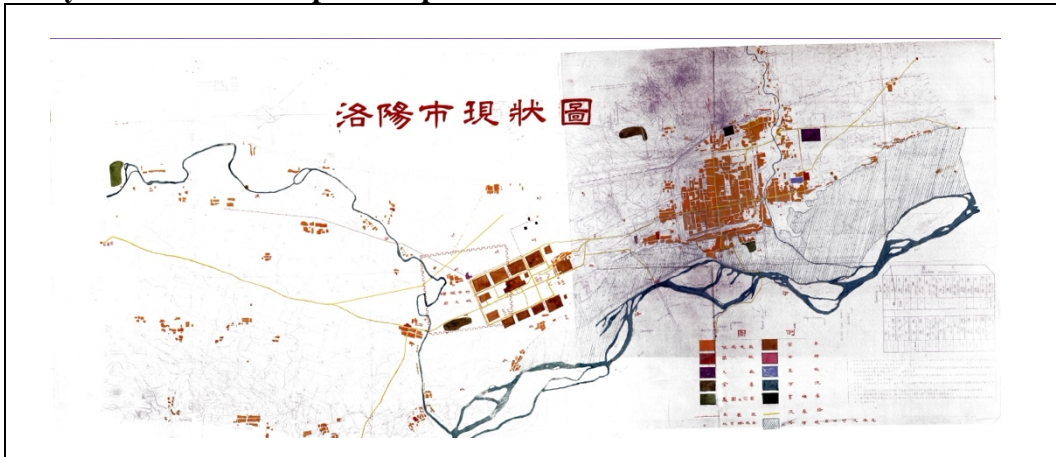
<p>Complete Map of the Administrative Division and Geography of Henan (<i>Fuzhi shanchuan quantu</i>) Source: Kangxi's <i>Henan Prefecture Annals</i></p>	<p>Complete Map of Cities, Fortifications, and Geographical Features (<i>Chengchi shanchuan quantu</i>) Source: Qianlong's <i>Luoyang County Annals</i></p>
<p>Map of Luoyang in Ming Dynasty Source: Qianlong's <i>Luoyang County Annals</i></p>	<p>Map of Luoyang in Qing Dynasty Source: Kangxi's <i>Luoyang County Annals</i></p>
<p>Map of Luoyang City and Gate Areas during the Qianlong period Source: Qianlong's <i>Luoyang County Annals</i></p>	<p>Map of Luoyang City during the Jianqing period Source: Jianqing's <i>Luoyang County Annals</i></p>

Republican Period

 <p>This is a detailed map of the inner city and gates of Luoyang in 1915. It shows the city's layout, including the central palace area, surrounding streets, and the four main gates. The map is titled '洛陽城內及城門區域圖' (Map of Luoyang's Inner City and Gates Areas).</p>	 <p>This is a general map of Luoyang in 1923, showing the city's location within a larger regional context. It includes a network of roads and rivers. The map is titled '洛陽' (Luoyang).</p>
<p>Map of Luoyang's Inner City and Gates Areas in 1915 Source: Academia Sinica of Taiwan, China</p>	<p>Map of Luoyang in 1923 Source: http://www.ccartoa.org.tw/</p>
 <p>This is a detailed map of Luoyang in 1934, showing the city's layout and surrounding areas. It includes a network of roads and rivers. The map is titled '洛陽' (Luoyang).</p>	 <p>This is a detailed map of Luoyang in 1935, showing the city's layout and surrounding areas. It includes a network of roads and rivers. The map is titled '洛陽' (Luoyang).</p>
<p>Map of Luoyang in 1934 Source: http://www.ccartoa.org.tw/</p>	<p>Map of Luoyang in 1935 Source: http://www.ccartoa.org.tw/</p>
 <p>This is a detailed map of Luoyang in 1938, showing the city's layout and surrounding areas. It includes a network of roads and rivers. The map is titled '洛陽' (Luoyang).</p>	 <p>This is a detailed map of Luoyang in 1944, showing the city's layout and surrounding areas. It includes a network of roads and rivers. The map is titled '洛陽' (Luoyang).</p>
<p>Map of Luoyang in 1938 Source: http://www.ccartoa.org.tw/</p>	<p>Map of Luoyang in 1944 Source: http://www.txlzp.com/ditu/2934.html</p>

	
<p>Aerial photo of Laocheng and Xigong Source: Academia Sinica of Taiwan, China</p>	<p>Aerial photo of Laocheng and Xigong Source: Academia Sinica of Taiwan, China</p>
	
<p>Aerial photo of Laocheng Source: Academia Sinica of Taiwan, China</p>	<p>Aerial photo of Xigong Source: Academia Sinica of Taiwan, China</p>
	
<p>Aerial photo of Laocheng by US Air Force Source: https://hpcbristol.net/search?query=loyang</p>	<p>Aerial photo of Laocheng in 1940s Source: School of Architecture, HAUST</p>

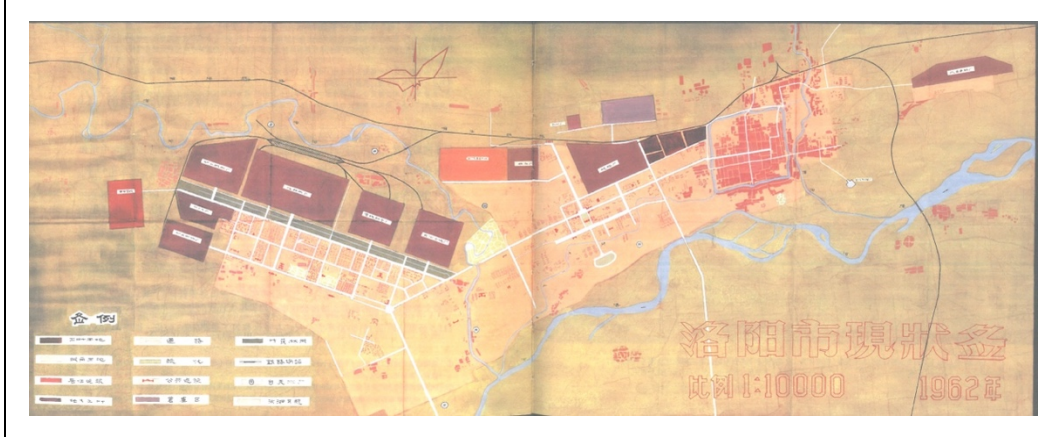
Early Years of the People's Republic of China



Luoyang Urban Status Map After the Founding of the People's Republic of China, Early 1950s
Source: School of Architecture, HAUST



Master Plan of Luoyang
Source: *Ba Da Zhongdian Chengshi Guihua*



Luoyang Urban Status Map, 1962
Source: *Ba Da Zhongdian Chengshi Guihua*



KeyHole Satellite Map of Luoyang, 1960s
Source: USGS Official Website



KeyHole Satellite Map of Luoyang, 1980s
Source: USGS Official Website

Appendix B: Chronology of Major Events Influencing the Development of Modern Luoyang

Late Qing Dynasty

1903

November: Minister Sheng Xuanhuai of the China Railway Corporation and representative of the Belgian Tramway and Railway Company, Lufar, signed the “Bianluo (Luoyang-kaifeng) Railway Loan Agreement” and the “Bianluo (Luoyang-kaifeng) Railway Operating Agreement” in Shanghai.

1904

April: Survey work for the Luoyang-Kaifeng Railway began.
October: The Henan Provincial Middle School was established.

1905

January: Luoyang Higher Primary School was established.
May: The Luoyang-Kaifeng Railway re-survey began.

1906

May: As the Luoyang-Kaifeng Railway was being constructed, a telegraph line was established connecting Kaifeng, Zhengzhou, and Luoyang.

1907

In response to the late Qing reform, the Luoyang County Commercial Association was established.

1909

April: Luoyang County Council was established.
December: The entire Luoyang-Kaifeng Railway was completed.

1910

January: The Luoyang-Kaifeng Railway officially opened.
February: Luoyang County Police were established.
August: Construction of the Luoyang-Tongguan Railway began.

Republic of China Period

1914

Yuan Shikai sent his son, Yuan Keding, to Luoyang to prepare for the construction of a military camp.

1916

April: The original Zhougong Temple (Duke of Zhou Temple) was repurposed to establish the Yuxi Normal School.

This year, the Xigong Military Camp was completed.

1918

The third and fourth divisions of the Northwest Border Defense Army were stationed at Xigong Military Camp in Luoyang.

1920

September: Wu Peifu established a military command in Luoyang.

This year, Wu Peifu built the first airport in Henan at Xigong Military Camp and established a water plant at Qilihe to supply water to the area.

1922

Wu Peifu constructed a reinforced concrete bridge across the Luo River south of Xigong Military Camp.

1923

August: Wu Peifu established a radio station at Xigong, which was completed in March the following year.

December: The Henan Provincial Government Office was relocated to Xigong, making Luoyang the provincial capital for the first time.

1924

March: The Beijing government purchased eight airplanes from France, four of which were made available to Wu Peifu.

April: A successful test flight was conducted along the Luoyang-Xian route.

May: Public bus service between Xigong and Luoyang East Railway Station was launched.

September: Wu Peifu led forces north to command the Zhifeng Battle.

November: After his defeat, Wu Peifu returned to Luoyang.

December: Wu Peifu resigned and left Luoyang.

1926

March: Wu Peifu successfully reclaimed control of Luoyang after defeating Feng Yuxiang.

1927

May: Feng Yuxiang's army invaded Luoyang.

June: Feng Yuxiang, as the Chairman of the Henan Provincial Government, initiated reforms in the province.

December: Xigong Military Camp was renamed Xinliu Camp.

This year, Feng Yuxiang converted the Henan Prefecture City God Temple into Zhongshan Park, and the Nationalist Government rebuilt the airport at Xigong, adding two brick and wooden hangars. The He Luo Library was founded.

1932

January: The Nanjing National Government moved its capital to Luoyang.

March: The Fourth Central Committee of the Nationalist Party held a meeting in Luoyang.

March: The Nationalist Government designated Luoyang as its provisional capital and Xian as a secondary capital.

April: The Nationalist Government held the "National Crisis Conference" in Luoyang to discuss topics such as "honoring the nation, disaster relief, and pacification." A passenger and postal route between Nanjing and Luoyang was opened. Eurasian Airlines started the Shanghai-Nanjing-Luoyang-Xi'an route.

May: The senior leaders of the Nationalist Party, government, and military returned to Nanjing.

November: The Nationalist Central Committee decided to relocate the party headquarters and Nationalist Government back to Nanjing by December 1.

December: The Nationalist Government officially ordered the capital to be returned to Nanjing.

1933

September: The Central Military Academy Luoyang Branch was established, training four cohorts of students. The Luoyang Electric Plant was also under construction.

This year, Luoyang Airport was renovated.

1937

September: Luoyang held an anti-Japanese rally.

November: To avoid Japanese air raids, the Central Military Academy Luoyang Branch was renamed the "First Branch" and relocated to Hanzhong, Shaanxi. The Japanese conducted their first air raid on Luoyang, bombing several buildings.

1938

January: Chiang Kai-shek held a military conference in Luoyang to discuss the First and Second Battle Zones.

February: In response to the advancing Japanese forces, the Nationalist Government ordered the demolition of the railway between Zhengzhou and Luoyang.

June: The First Battle Zone Command was relocated from Zhengzhou to Luoyang, making Luoyang the front line in the war against Japan.
July: Japanese bombers attacked Luoyang, bombing the vegetable market and Lao Ji Street, causing over 200 casualties.

1941

May: Over 80 Japanese aircraft bombed Luoyang, causing the “first great tragedy” of the Anti-Japanese War. The *Luoyang County Annals* recorded this event as “over 100 bombings, with this being the most devastating.”

1944

May: Luoyang fell under Japanese occupation.

1945

August: Luoyang was liberated, and on August 18, the National Revolutionary Army entered Luoyang to accept the Japanese surrender.

Early Years of the People’s Republic of China

1953

July: Preparations for the establishment of the No.1 Tractor Factory (Code 081 Factory) began.

September: The Construction Bureau of the Ministry of Construction established the Luoyang Urban Planning Group.

November: According to central government directives, work began on selecting a location for factories further away from the old city, to the west of the Jian River.

December: Li Fuchun, Deputy Director of the National Planning Commission, and Soviet expert Kisinisky visited Luoyang to inspect the conditions for factory construction.

1954

January: The plan for the joint factory in Luoyang was approved by the National Planning Commission and received approval from Chairman Mao Zedong.

March: The Central South Bureau approved the establishment of the Luoyang Factory Construction Committee, headed by Pan Fusheng, First Secretary of the Henan Provincial Party Committee. The Luoyang Urban Planning Group began compiling various materials, and experts from other regions joined the team.

June: The Ministry of Construction held the first national urban construction conference, and Luoyang was officially designated as a “new industrial city with significant industrial construction,” entering the list of the eight key cities for industrial development. Construction of the Qinjing Flood Control Canal in the Jianxi area began.

September: Construction of the Jian River Railway Bridge to the Jianxi industrial

and mining enterprises commenced.

October: The *General Plan for the Jianxi District of Luoyang* was completed.

December: The National Construction Commission agreed in principle to use the *General Plan for the Jianxi District of Luoyang* as the basis for the current external factory construction and the first-phase residential area development.

December: The Luoyang Public Bus Station was established.

1955

September: Construction of auxiliary factories and production plants for the Roller Bearing Factory began.

October: The groundbreaking ceremony for the No.1 Tractor Factory in took place.

December: Construction began on the Luoyang Mining Machinery Factory.

1956

May: Wangcheng Park was completed and opened to the public. The Ministry of Metallurgy decided to build a refractory materials factory in Luoyang.

June: The Luoyang Thermal Power Plant and Copper Processing factory broke ground.

July: The *General Plan for the Jiandong District of Luoyang* (also called the *Urban Master Plan for Jiandong and Jianxi Districts*) was completed as the overall city master plan.

This year, the National Planning Commission approved the Ministry of Textile Industry to establish a large cotton textile printing and dyeing factory in Luoyang.

1957

January: The construction of the plant area for the Luoyang Copper Processing Factory began, and the first batch of equipment warehouses was constructed.

February: Some workshops of the Luoyang Mining Machinery Factory began production.

August: The National Construction Commission approved the relocation of the High-Speed Diesel Engine Factory to the Jianxi District of Luoyang.

September: The Luoyang Department Store was completed and opened.

December: The first unit of the Luoyang Thermal Power Plant began generating electricity.

1958

April: Construction of the Luoyang Glass Factory began.

June: Construction of the Luoyang Refractory Materials Factory began.

May: The Henan Diesel Engine Factory (Code 407 Factory) was relocated to Luoyang, and the main factory building began construction.

July: The first-phase project of the Roller Bearing Factory was completed and put into production.

November: The Luoyang Mining Machinery Factory passed national inspection

and began production on November 1.

November: The tool workshop and machine repair workshop of the Henan Diesel Engine Factory began production, with some product components starting trial production in May of the following year.

1959

November: The No.1 Tractor Factory passed national inspection and went into production.

November: Some of the infrastructure at the Luoyang Refractory Materials Plant was completed, and production started.

December: The comprehensive auxiliary workshops of the Copper Processing Factory began trial production.

1961

July: The 612 Institute was established in Luoyang.

1962

January: The Luoyang Copper Processing Factory began partial production, with full production achieved by 1965.

1964

March: The Luoyang Nonferrous Metal Design Institute was established.

June: The Henan Diesel Engine Factory began production.

December: The Luoyang Glass Factory successfully produced flat glass as part of a trial production.

1965

December: The Shenyang Mining Machinery Research Institute relocated to Luoyang and merged with the product design department of the Luoyang Mining Machinery Factory to form the Mining Machinery Research Institute.